SNAGGING WITHIN NEW HOMES IN THE UK: AN ANALYSIS BETWEEN ENGLAND AND SCOTLAND

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Abstract: The process of buying a new house often ends in tears for the buyer. The buyer suffering stress as a result of the number of snags encountered on what should have been their pride and joy. The matter is exacerbated by builders who often take a recalcitrant view on how to alleviate the situation. This recalcitrance being founded on the dearth of legislation to protect the house buyer. This paper discusses 'snagging' in the overall house buying process and evaluates the number of snags being discovered on new houses which have been 'signed-off' as being suitable for the buyer to move in to. The range and nature of the snags discovered on a geographical basis is considered in some detail. In order to ensure quality in new houses it is imperative that the house builder knows exactly how snags occur (the composite effect of defects, errors and omissions) and the impact on the finished product i.e. the new home. House builders will continue to neglect a real approach to quality (as defined by the buyer) and therefore snagging will remain a perennial feature of the house building process. The figures and analysis from this research represent the most accurate statistics on snagging levels found in new homes in the UK.

Keywords: House Building, Information, Snagging, Workmanship

1. INTRODUCTION

The last decade has witnessed a constant clamour from both clients and government for improvements in the quality of the finished product delivered by the house building sector of the UK construction industry. UK government ambitions to improve the quality of new homes have prompted a number of house builders to consider the implementation of quality initiatives such as Total Quality Management (TQM) and ISO 9000 (Sommerville, 1994). The import of these quality initiatives is at best questionable and their adoption does not appear to be a guarantee of an improvement in the quality of the finished article (Sommerville et al., 2004).

The volume of research specifically related to quality in new-build housing is remarkably scant given the size of the industry. The research that is there focuses predominantly on regulatory defects i.e. contraventions to either building regulations or the warranty providers' standards. No in-depth research has been carried out on "snagging", although the importance of snagging is shown by the fact that the last three Housing Forum/MORI customer satisfaction surveys carried out in 2000, 2001 and 2003 report an increasing number of new home purchasers as being unhappy with the quality of their new home, the recorded levels of satisfaction showing a downward trend.

The aim of this research was to examine the differences in snagging levels found within new homes within the UK on a geographical basis. The importance of the snagging

process from the builder, the home buyer, the regulatory inspector and the independent inspector point of view is discussed which reveals how each party within the snagging process rates each particular aspect of the actual snagging items. Initial analysis of snagging data from 1696 new homes built by 271 UK house builders demonstrates the levels of snagging a home buyer could expect to find when purchasing a new home. It is clear that the snagging problem has worsened in 2005 with particular concern being placed upon new homes built within Scotland.

2. SNAGGING IN NEW HOMES

Snagging has almost become enshrined within the house building cultural paradigm as an accepted feature of the overall house building process. It has assumed a degree of acceptability, even though it is an unwelcome feature of modern house building. The term is widely applied within the UK construction industry: extraction of definitions of the term from within a range of built environment literature includes: rework, non-conformance, repairs, quality failures, quality deviations and defects (Love 2002). A definition of snagging that may be more acceptable across the broader spectrum of house builders is the identification and rectification of errors, defects and omissions within a new house.

Love and Li (2000) see rework as being "the unnecessary effort of re-doing a process or activity incorrectly implemented the first time". The process of 'snagging' has been defined (by independent UK body Inspector Home) as "the act of checking a new home for difficulties with the quality of finish and workmanship". These definitions concur with Ong (1997), who suggests that by its very nature the composite house building process often leads to minor defects being found in the finished article.

A number of factors that influence the quality of a construction product can be attributed to the design of the project and more importantly poor workmanship (Love and Sohal, 2003). Snagging involves the rectifying of mistakes and ineffective work (poor workmanship). For contractors and home buyers, snagging works cause unnecessary distress and conflict especially when they appear after practical completion has been awarded.

Within the UK, It is clear that the buyer plays decisive roles in selecting the house builder and the actual house itself, along with the finance provider. With conclusion of missives to purchase, the control of quality on the new house moves from what may be perceived as the buyer's realm to the builder and mortgage lenders. Although in reality, the quality expectations were never that of the buyer. The quality standards are set and managed by the builder – in some cases even the inspection of the house for habitation approvals is significantly controlled by the builder. The home buyer has no control over the quality of the finished product. The mortgage lender seeks assurance that the house will be 'fit for purpose' and this is attained by the builder through the use of NHBC (or other approval body).

The current snagging systems operating within new home builders quality procedures provide little comfort to the most important member of the house building supply chain "the customer" (Sommerville et al., 2004). Many homeowners are forced into purchasing sub-standard homes with promises of remedial work to follow only to find

that once the missives are complete the house builder is reluctant to rectify any outstanding snagging items.

3. SNAGGING: CLASSIFICATION MAPPING

Snagging is a common phenomenon within the industry and this has a deleterious effect upon the parties to the contract and the wider industry image. Snagging within the industry is inevitable and can be attributed to a number of sub-processes which act as indicators and moderators. The initiation of any construction or house building project involves two central aspects: tasks, which are to be executed, and people, who must carry out the various tasks. Snagging occurs when these tasks are not carried out to standards or specification or are not properly performed by industry trades. Georgiou et al., (1999) have grouped snagging items under three different headings.

1. Technical, when workmanship, materials or design elements of a building reduce its ability to function.
2. Omissions, parts or features of a home that are simply "omitted".
3. Aesthetic, when the appearance or finish of a building is adversely affected.

A single snagging item (for example "a missing air brick) can be considered separately under each heading or can be grouped under or can overlap all three. Either way, the snagging item has occurred. Figure 1 indicates that there are 7 possible snagging scenarios to be considered.

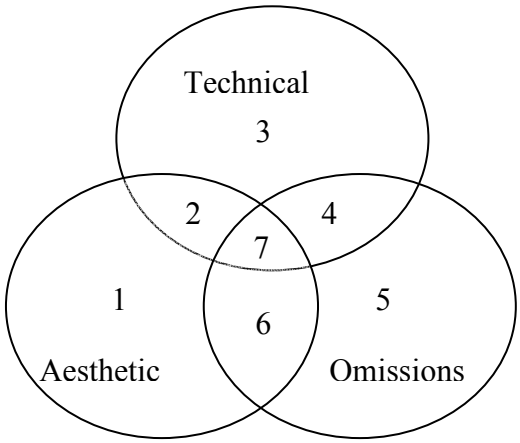

Figure 1: Possible snagging scenarios

The ability to allocate a snagging item within one or more of the above scenarios will allow timely decisions to be made and appropriate actions to be executed. Allocating an item under a specific heading however is not straight forward. For example a missing airbrick could be considered and grouped under all seven headings as follows:

1. Aesthetic – because the air brick is missing the building is unsightly.
2. Aesthetic/technical - because the air brick is missing the building is unsightly and the issue is technical because it does not comply with building regulations.

3. Technical - the issue is technical because it does not comply with building regulations.
4. Technical/omission - the issue is technical because it does not comply with building regulations and is an omission because the brick is "not there".
5. Omission – it is an omission because the brick is "not there".
6. Omission/aesthetic - it is an omission because the brick is "not there" and because the brick is missing the building is unsightly.
7. Aesthetic/technical/omission – a combination of all three aspects.

Snagging tends to be identified once practical completion has been awarded by the local authority or National House Building Council (NHBC) and often involves items that are found by the architect, NHBC inspector, clerk of works, project manager, site manager and home owner during a walk around the new home. However, each of the parties that identify the snagging items have differing priorities when concerned with the aspects of snagging (items 1-7 above) as displayed in table 1. For example the home owner is more concerned with the aesthetic items identified where as the compliance inspector tends to sway towards the items that are technical.

Table 1: Importance of snag factors to respective parties (I = importance, H= high, L = low)

Snag Factor	**Home Buyer**	**Builder**	**Compliance Inspector**	**Independent Inspector**
1 - Aesthetic	I^H	I^L	I^L	I^H
2 - Aesthetic/technical	I^L	I^L	I^H	I^L
3 - Technical	I^L	I^H	I^H	I^L
4 - Technical/Omission	I^L	I^H	I^H	I^L
5 - Omission	I^H	I^H	I^L	I^H
6 - Omission/Aesthetic	I^H	I^L	I^L	I^H
7 - Combination of 3	I^H	I^H	I^H	I^H

It is important is to understand the processes of snagging which may be witnessed within construction and house building projects. To consider the origins of the snagging (especially the individual parties concerned), its evolutionary processes and the eventual effects of the snagging situation require examination. The identification and analysis of these important facets of snagging will allow the development of a greater understanding of the snagging situation and so enable a more comprehensive approach to its reduction in levels or even complete elimination.

Within the majority of construction projects there are a clear set of originators or sources of snagging:

1. From the Client (their organisation or their representatives) through design changes to the project
2. From the Client (their organisation or their representatives) through material changes to the project
3. From within the contractor's organisation
4. From within the sub-contractors through workmanship issues
5. From professional bodies (Inspectors) through technical issues
6. From bodies external to the above.

These originators may act either in isolation or interact simultaneously with each other, ensuring that the process of locating the finite source of the snagging item is extremely difficult. The originators give rise to several common causes of snagging which may be grouped under the following broad headings:

1. Material faults and failures
2. Omissions (brought about through supply chain delivery failure or poor practice on site)
3. Design faults and functional changes
4. Variations in working practises
5. Workmanship and poor practice issues caused through a lack of understanding and a lack of skilled operatives
6. Time issues which determine the speed of progress
7. Cost issues which may force a combination of the above

The sources and causes of snagging are part of the larger territory of the snagging event, which may be analogous to any project i.e. there is a start point, discernible intermediate stages, and some form of ending (usually to the builders benefit). The larger dimension is considered in Figure 2 which maps and integrates the sources, the causes and the snagging event itself.

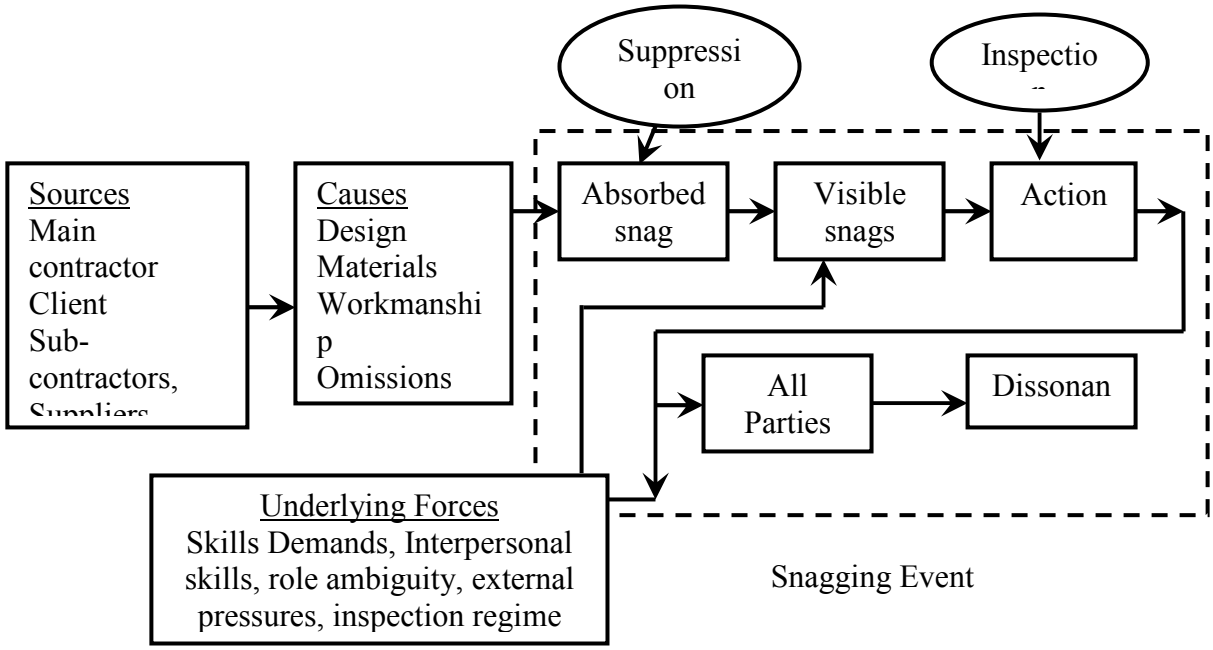

Figure 2: Snagging event mapping (adapted from Sommerville, 1992)

It may be argued that project performance is a variable which is dependant upon: the functionality of the snagging event; its significance, and its certainty. These variables may be mapped (as shown in Figure 3.) to produce a classification structure for the eight potential scenarios. These scenarios are listed in Table 2.

The current scenario within the construction industry is that snagging is significant, unavoidable and dysfunctional. The industry however needs to move away from this extremely damaging scenario and ensure snagging becomes insignificant, avoidable and functional as displayed in Figure 3. This significant change in scenarios would

almost certainly require a change in working attitudes, a change in working practises and more importantly a shift in attitude towards the home buyer with the ultimate goal of becoming "customer focused".

Table 2: Snagging Classification Potentials

Potential		**Expansion**	
	Significance	**Certainty**	**Functionality**
S.U.D.	significant	unavoidable	dysfunctional
I.U.D.	insignificant	unavoidable	dysfunctional
S.U.F.	significant	unavoidable	functional
I.U.F.	insignificant	unavoidable	functional
S.A.D.	significant	avoidable	dysfunctional
I.A.D.	insignificant	avoidable	dysfunctional
S.A.F.	significant	avoidable	functional
I.A.F.	insignificant	avoidable	functional

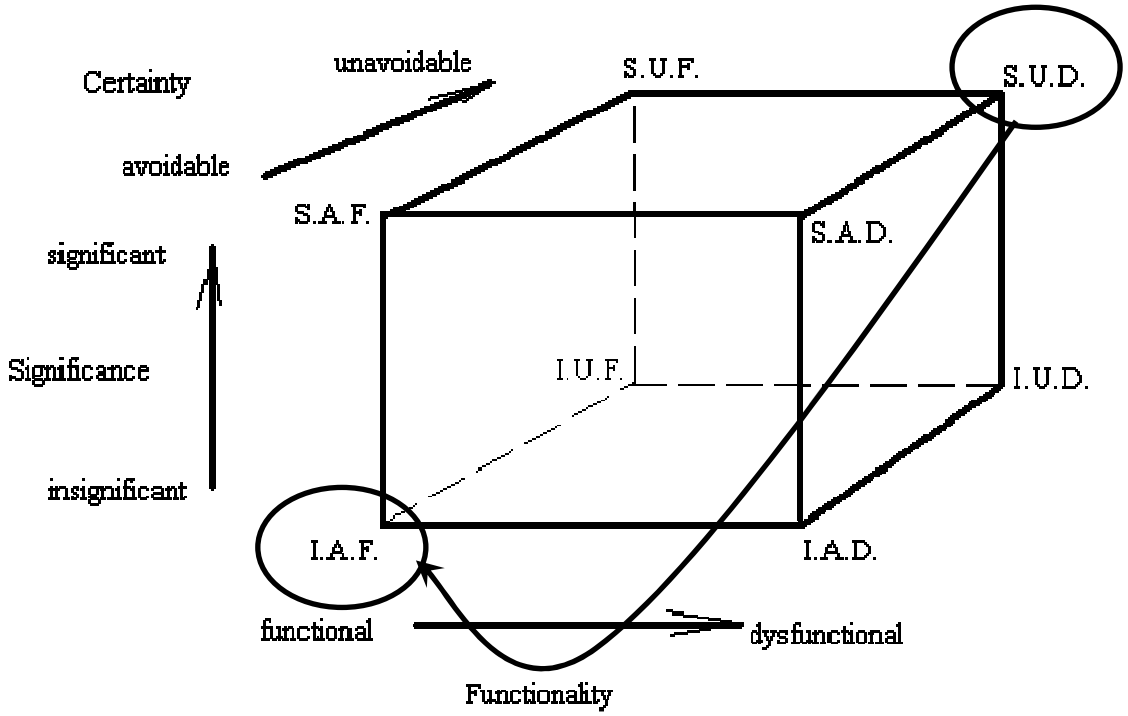

Figure 3: Snagging Classification Mapping (adapted from Sommerville, 1992)

4. METHODOLOGY AND DATA ANALYSIS APPROACH

The snagging process or indeed the collection of snagging data has rarely been written or reported upon within the UK construction and housing industry which has resulted in a dearth of literature and data sets available to the authors of this paper. The data sets available for analysis within this research are limited: both in terms of the actual quantity of data available and the access to such data sets from different members of

the snagging process chain. There is an implicit constraint within the methodology that the data used in this research was extracted from a data set provided by the UK's leading independent home snagging company. The argument would be that this is a biased population. Indeed it is the only detailed independent dataset available and as such is deemed to be robust until new data sets are made available within the public domain. The independent inspection company provides a 'snagging' or defect reporting system for buyers of new homes (under the instructions of the home buyer) through 43 inspectors based around the UK. Detailed inspection reports for 1696 homes have been formatted and analysed with the resultant dataset containing detailed information on circa 100,000 snagging items found within the 1696 properties built by some 271 house builders.

Data available for extraction from the inspection reports included a host of matter on: the name of the client, the location of the property, the type of property, the house builder, the independent inspector, date of inspection, number and type of snag and so on. For the sake of clarity in this paper the list noted above has been truncated. The variables within the datasets were numerically coded for statistical analysis. The names of 'clients', 'inspectors' and 'building companies' are not specified for confidentiality reasons. Data analysis was performed using different computer packages.

After the initial examination of the data it was clear that for many of the factors, such as builders and inspectors, there were a number of categories with very little data. These categories with low frequencies were then excluded from further analysis. The formatting of the data involved the examination and analysis of over 1m individual data cells. This paper will include analysis on select variables contained in the dataset which will give an initial picture of the extent of snagging in the construction industry in the UK.

5. DATA RESULTS AND DISCUSSION

The first factor considered during the analysis was the average number of snags across the 1697 properties over a 4 year period 2002 – 2005. Figure 4 below shows the average results obtained from the data: despite a decrease in the average number from year on year for 2002 – 2004, the average number for 2005 increased by 53%. There is a considerable range between the highest and lowest number of snags found within a new home, the lowest being one and the highest being 389 found within a five bedroom house situated in the North of England. Of these 389 snagging items, 380 were associated with a specific industry trade and related to "extremely poor workmanship".

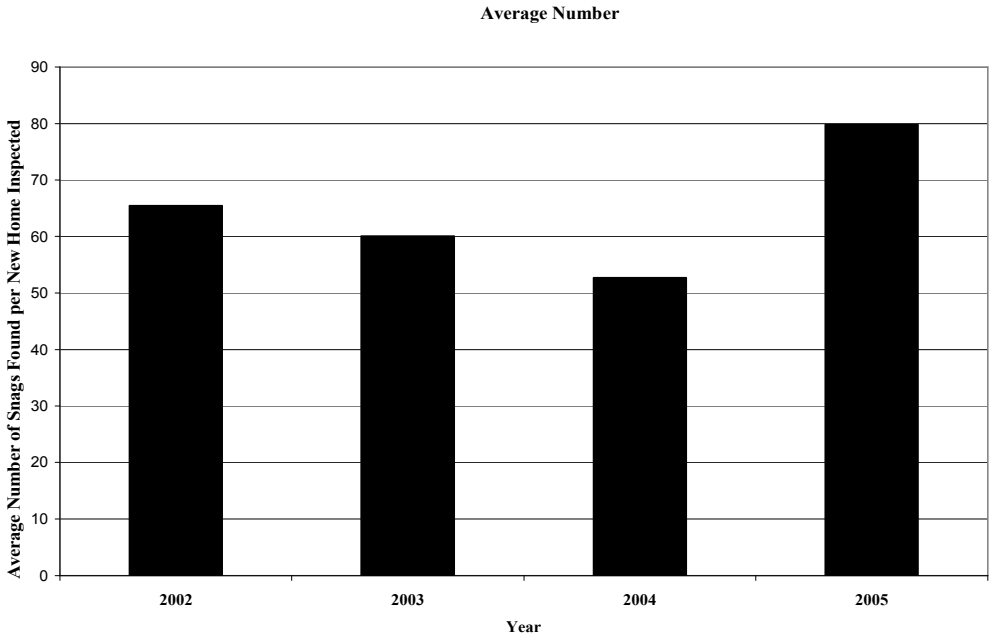

Figure 4: Average number of snags per property 2002 – 2005

Through observation of the different house sizes (by number of bedrooms) it has been discerned that the average number of snagging items found in each property type during the period 2002-2005 is as displayed in figure 5. It can be concluded that as the number of bedrooms within a property increases then so does the average number and range of snags found within each property. The rise in the average number for the majority of properties within the 2005 period follows the general trend set within figure 4.

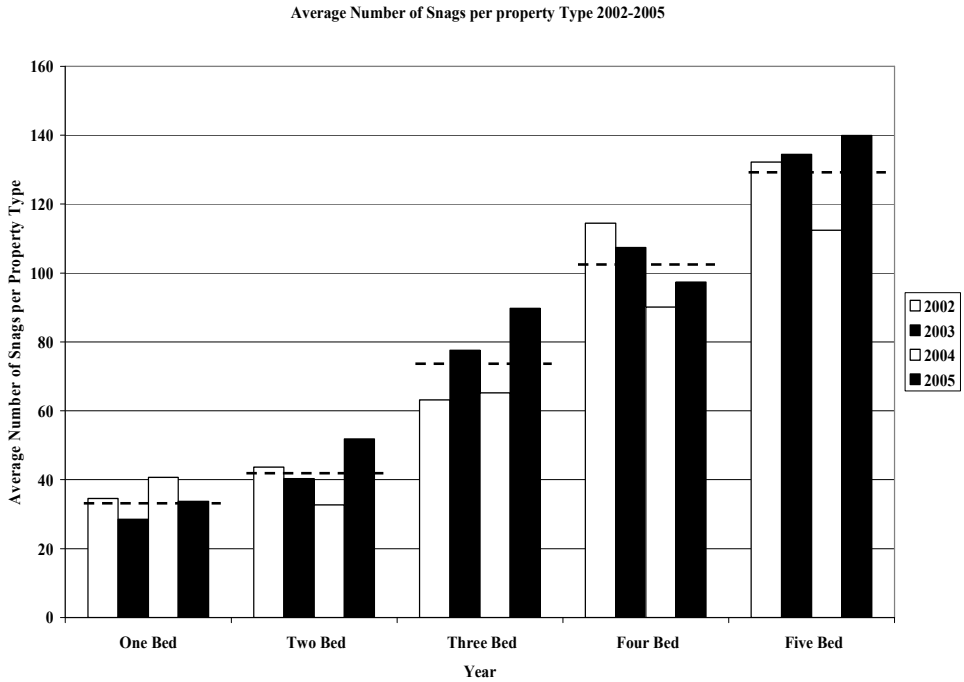

Figure 5: Average number of snags per property type 2002-2005

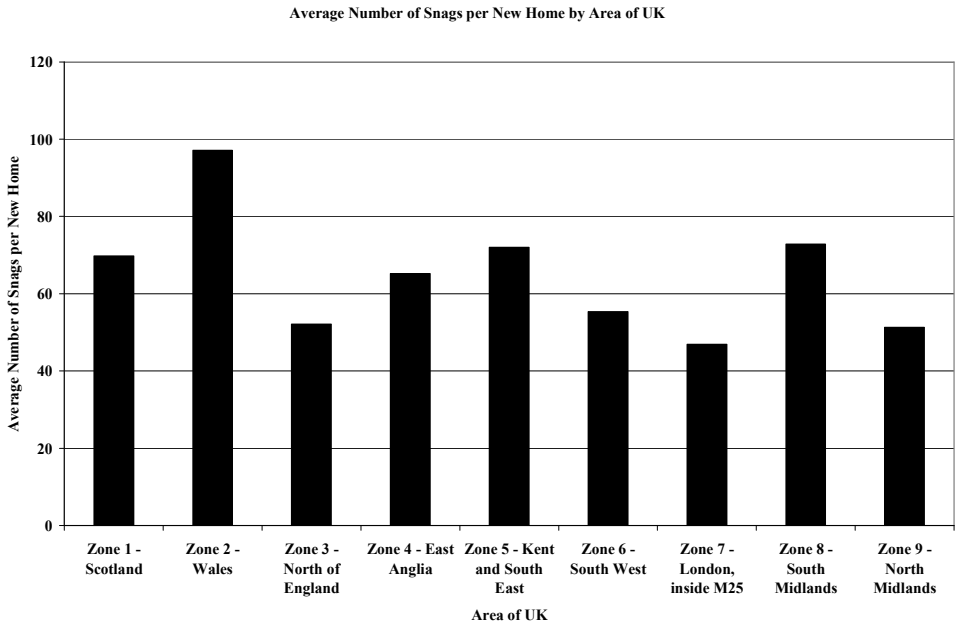

Figure 6: Average number of snags found per new home by area of UK

To investigate whether there was any differences in the number of snagging items found in properties within different geographical sectors of the UK, the data set was split into 9 UK regions. The results of the geographical analysis can be seen in Figure 6. The area within the M25 (London) was the area with the lowest amount of snagging items per property.

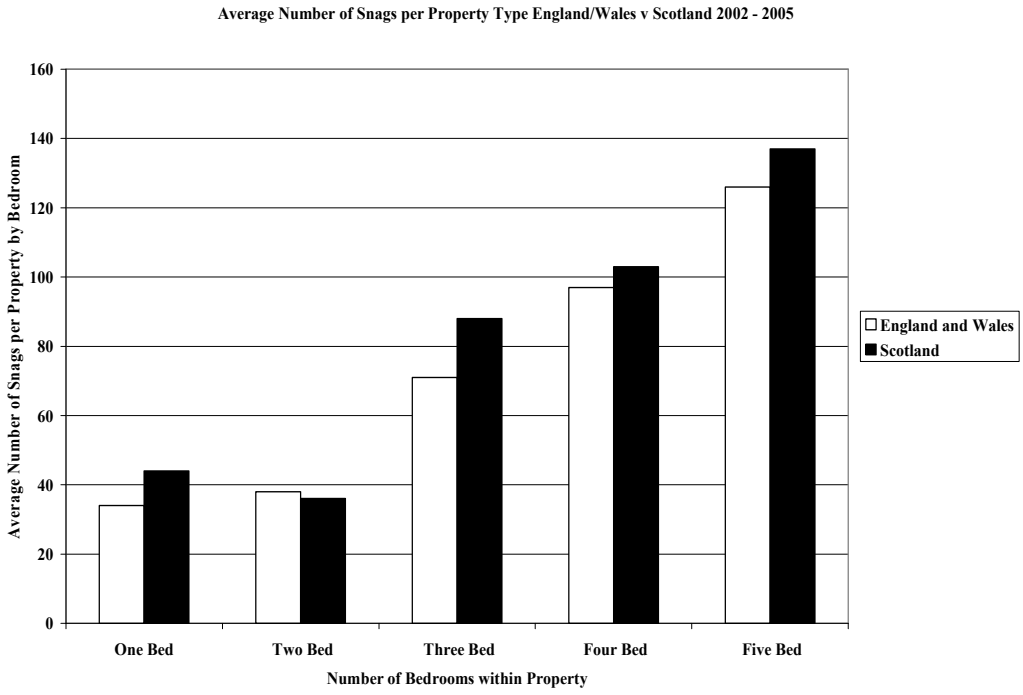

Figure 7: Average number of snags per property England/Wales v Scotland

Historically, Scotland has always been seen as a separate part of the UK due to its unique and distinct laws. This has been further highlighted through the process of devolution. Therefore, a UK regional analysis invariably seeks to compare Scotland with the rest of the UK. Figure 7 highlights the average number of snags per property type between Scotland and England/Wales. It can be seen that Scotland has a higher number of snagging items per property type in all of the categories except two bedroom properties.

5. CONCLUSIONS

The end-product within the house building supply chain "the new home" still has a number of snags which causes the customer to be repeatedly dissatisfied. Whilst the research in this paper has been to some extent exploratory, it has demonstrated that snagging levels in new homes in the UK are at a level which is damaging to the house building sector's image and they detract from customer satisfaction.

Quality systems that will effectively control the snagging process within the UK construction industry have been implemented to some extent although these are at best basic and therefore "snagging" has become an accepted and unwanted feature of the whole house building process and will remain so until the necessary legislation is put in place that will alleviate this problem.
The analysis provided within this paper although basic and descriptive has given an insight into the potential range of research which can be conducted from inspection reports undertaken on newly built homes. The research has provided evidence that a large number of snagging items can be found in newly built homes within the UK which are assumed to be "complete". Analysis on the number of snags found by house size was also undertaken and although an average was given the method should prove reliable for predicting the number of snags a home buyer could expect to find within a particular property type.

Geographically, the analysis highlighted some interesting differences in the levels of snagging found within 9 areas of the UK. The results have indicated that Scotland has a higher level of snagging per property type when compared to the same property types in England. The reasoning for this however could be caused by many factors such as the type of construction, attitudes of site managers, quality control procedures in existence, and trade skill/experience.

The investigations have provided some strong results as to the extent of the snagging problem within the industry. The results can be used by practitioners and built upon to investigate a problem which affects the most important member of the house building supply chain "the customer". Future research will mine the roots of the 'snags' problem and identify the types of activities and the types of tradesman that are responsible for the creation of snags within new homes. Future work will also examine in detail the snagging data collected from contractors and comparisons will be made against data collected by the independent inspectors to give an overall view of snags within the house building industry.

6. REFERENCES

Georgiou, J, Love, PED and Smith, J (1999) a comparison of defects in houses. Journal of Structural Survey, 17(3), 160-169.

Love, PED and Li, H (2000) Quantifying the causes and costs of rework in construction. Construction Management and Economics, 18, 479-490

Love, PED (2002) Auditing the indirect consequences of rework in construction: a case based approach. Managerial Auditing Journal, 17(3), 138-146

Love, PED and Sohal, AS (2003) Capturing rework costs in projects. Managerial Auditing Journal, 18(4), 329-339

Ong, SE (1997) Building defects, warranties and project financing from pre-completion marketing. Journal of Property Finance, 8(1), 35-51

Sommerville, J. (1992) Contingency management of conflict: an analysis of contract interfaces, Construction Conflict and Resolution, Fenn and Gameson (Eeds), London, pp 64-71

Sommerville, J (1994) Multivariate barriers to total quality management within the construction industry. Total Quality Management, 5(5), 289-298

Sommerville, J, Craig, N. and Bowden, S (2004) The Standardisation of Construction Snagging. Journal of Structural Survey, 22(5), 251-258