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TITLE:

**Explicating Excessive Financial Resource Allocation by
Building Control in Achieving Regulatory Conformity in
Domestic Extensions**

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ACKNOWLEDGEMENTS.....	VII
EXPLANATION OF TERMS USED	VIII
LIST OF ABBREVIATIONS AND TERMS.....	X
ABSTRACT.....	XII
EXPLICATING EXCESSIVE FINANCIAL RESOURCE ALLOCATION BY BUILDING CONTROL IN ACHIEVING REGULATORY CONFORMITY IN DOMESTIC EXTENSIONS	1
1.0 INTRODUCTION.....	1
1.1 BUILDING CONTROL PERSPECTIVES	1
1.2 THE PROBLEM	9
1.3 RESEARCH AIM.....	14
1.4 OBJECTIVES.....	14
1.5 CONTRIBUTION / SIGNIFICANCE	15
2.0 REVIEW OF THE CURRENT LITERATURE	17
2.1 INTRODUCTION.....	17
2.2 RESEARCH BACKGROUND.....	19
2.3 GOVERNANCE PHILOSOPHICAL AND THEORETICAL CONCEPTS.....	20
2.4 CURRENT TYPE OF REGULATION	21
2.5 ALTERNATIVE TYPES OF REGULATION	22
2.6 REGULATION AND DEREGULATION.....	24
2.7 PRIVATE AND PUBLIC CONTROL	27
2.8 LOCAL GOVERNMENT	28
2.9 VARIATIONS IN PRACTICE.....	29
2.10 ENFORCEMENT.....	31
2.11 BUILDING REGULATIONS APPLICATION PROCEDURES.....	33
2.12 CONCLUSION GOVERNANCE	35
2.13 SOCIAL	36
2.14 HOME OWNERS.....	37
2.15 DESIGNERS.....	39
2.16 BUILDERS	42

2.17 REGULATORS	48
2.18 CONCLUSION SOCIAL	50
2.19 TECHNICAL COMPLICATIONS	51
2.20 CONCLUSION TECHNICAL COMPLICATIONS	53
2.21 OVERALL CONCLUSION	54
3.0 RESEARCH METHODOLOGY	56
3.1 RESEARCH ONTOLOGY AND EPISTEMOLOGY	57
3.2 THEORETICAL PERSPECTIVES	59
3.3 RESEARCH STRATEGIES	61
3.4 METHODOLOGY OF THE PRESENT RESEARCH	65
3.5 ETHICS	75
3.6 STUDY LIMITATIONS	75
4.0 PRELIMINARY EXPLORATION PHASE	77
4.1 INTRODUCTION	77
4.2 PRELIMINARY EXPLORATION	78
4.3 PHASE 1 PILOT CASE STUDY OF A DOMESTIC EXTENSION	79
4.4 PHASE 2 QUESTIONNAIRES AND ARCHIVAL RETRIEVAL	86
5.0 CASE STUDY IMPLEMENTATION PHASE	92
5.1 INTRODUCTION	92
5.2 CASE STUDY IN DISTRICT 1	100
5.3 CASE STUDY IN DISTRICT 2	106
5.4 CASE STUDY IN DISTRICT 3	109
5.5 CASE STUDY IN DISTRICT 4	112
5.6 CASE STUDY IN DISTRICT 5	117
5.7 CASE STUDY IN DISTRICT 6	121
5.8 STRUCTURAL SURVEYS	125
5.9 PARTICIPANT DESCRIPTIONS	126
5.11 DOCUMENTATION	137
5.12 ARCHIVAL RETRIEVAL	137
6.0 EMERGENT SECTORIAL MATERIAL AND ANALYSIS	143

6.1 INTRODUCTION	143
6.2 <i>GOVERNANCE</i> ADMINISTRATIVE AUTHORITY.....	149
6.3 ADMINISTRATIVE AUTHORITY ANALYSIS	156
6.4 <i>GOVERNANCE</i> TYPE OF REGULATION	160
6.5 TYPE OF REGULATION ANALYSIS.....	167
6.6 <i>GOVERNANCE</i> TYPE OF APPLICATION	173
6.7 TYPE OF APPLICATION ANALYSIS	177
6.8 <i>SOCIAL</i> HOME OWNERS' VIEWS.....	179
6.9 HOME OWNERS' VIEWS ANALYSIS	181
6.10 <i>SOCIAL</i> DESIGNERS' VIEWS.....	183
6.11 DESIGNERS' VIEWS ANALYSIS	185
6.12 <i>SOCIAL</i> BUILDERS' VIEWS	188
6.13 BUILDERS' VIEWS ANALYSIS	190
6.14 <i>SOCIAL</i> BUILDING CONTROL OFFICERS' VIEWS	195
6.15 BUILDING CONTROL OFFICERS' VIEWS ANALYSIS	196
6.16 VIEWS <i>TECHNICAL COMPLICATIONS</i>	200
6.17 TECHNICAL COMPLICATIONS ANALYSIS.....	206
6.18 CROSS CASE DEVELOPING ISSUES	208
6.19 SUMMARY OF CASE STUDIES OF PROBLEMS AND DETAILS	215
7.0 EVALUATION OF THE EMPIRICAL EVIDENCE	219
7.1 THE PROBLEM.....	219
7.2 CHARACTER OF EXTRA RESOURCE USE	219
7.3 FEE SETTING FUNCTION LEGISLATION	220
7.4 COMPETITION.....	222
7.5 ENFORCEMENT OPERATIONS.....	223
7.6 OVERHEAD CHARGES	224
7.7 POLITICS	225
7.8 ECONOMIES OF SCALE	226
7.9 STRUCTURE OF ENFORCING AUTHORITIES.....	227
7.10 BUILDING CONTROL INSTIGATED INSPECTIONS	228
7.11 TYPE OF REGULATION (INCLUDING SELF-REGULATION)	229
7.12 TYPE OF APPLICATION	230

7.13 HOME OWNERS.....	231
7.14 DESIGNERS.....	232
7.15 BUILDERS	233
7.16 BUILDING CONTROL OFFICERS	234
7.17 TECHNICAL COMPLICATIONS	236
7.18 SUPPLEMENTARY PROPOSITIONS	236
7.19 PARTICIPANTS VIEWS' AND OPINIONS.....	237
7.20 SUMMARY	239
8.0 SUGGESTIONS AND SOLUTIONS	241
8.1 NON-FUNCTIONAL SOLUTIONS.....	242
8.2 MOVE TO SELF-CERTIFICATION OR IN-HOUSE DESIGN SERVICE	243
8.3 REMOVE FEE CHARGE	245
8.4 REMOVE THE CROSS SUBSIDY RULES	246
8.5 TRANSFER OF THE SCALE FEE CATEGORIES	247
8.6 FUNCTIONAL SOLUTIONS.....	248
8.7 FEE RECHARGES LEGISLATION.....	249
8.8 BUILDING CONTROLS' ADDITIONAL SITE INSPECTIONS COSTINGS.....	249
8.9 UNEXPECTED EXTERNALITIES	251
8.10 HOME OWNERS.....	255
8.11 PROCEDURES AND PROTOCOLS OF BUILDING CONTROL.....	259
8.12 DESIGNERS.....	263
8.13 SUMMARY	271
9.0 CONCLUSION	272
9.1 PREAMBLE	272
9.2 FACTUAL CONCLUSIONS	278
9.3 CONCEPTUAL CONCLUSIONS	281
9.4 IMPLICATIONS.....	288
9.5 RESEARCH CULMINATION.....	289
REFERENCES/BIBLIOGRAPHY	294
APPENDICES	338

APPENDIX 1 CONSENT FORM	338
APPENDIX 2 LETTER REGARDING PILOT STUDY	340
APPENDIX 3 LETTER TO HEADS OF DEPARTMENTS	342
APPENDIX 4 LETTER TO PARTICIPANTS	344
APPENDIX 5 PARTICIPANTS INVITATION LETTER	345
APPENDIX 6 PERMISSION FOR ACCESS TO PROJECT FILES	347
APPENDIX 7 PARTICIPANT INFORMATION SHEET	348
APPENDIX 8 REGISTER OF BUILDERS	352
APPENDIX 9 STANDARD DETAILS AND REGULATIONS FOR DOMESTIC EXTENSIONS	354
APPENDIX 10 PLANNING INFLUENCE	357
APPENDIX 11 FEE SCALES AND VALUE FOR MONEY	360
APPENDIX 12 EXTRA FEE CHARGES	363
APPENDIX 13 SUMMARY OF EXTRA INSPECTIONS CAUSED BY HOME OWNERS	366
APPENDIX 14 SUMMARY OF MISTAKES CAUSED BY DESIGNERS	367

List of Tables

TABLE 1 QUESTIONNAIRE.	87
TABLE 2 ARCHIVE FIGURES.....	88
TABLE 3 TYPE OF LOCAL AUTHORITY.....	93
TABLE 4 PARTICIPANTS' RESPONSES REGARDING THE USE OF BUILDING NOTICES.	176
TABLE 5 SUMMARY OF PROBLEMS.....	215
TABLE 6 INSPECTION COSTS.....	217

List of Figures

FIGURE 1 CATAGORIES OF WORKS.	5
FIGURE 2 THEMES WITHIN THE LITERATURE CHAPTER.	17
FIGURE 3 REGULATORY HARM AND BENEFITS CONFIGURATION.....	26
FIGURE 4 POSSIBLE INFLUENCES ON EXTRA ECONOMIC RESOURCE.	56
FIGURE 5 DISCIPLINARY MODEL (BIGLAN, 1973).....	59
FIGURE 6 PLANS OF PROJECT IN DISTRICT 2	106
FIGURE 7 PLANS AND REAR ELEVATION OF PROJECT DISTRICT 5.....	117
FIGURE 8 FRONT ELEVATION OF PROJECT IN DISTRICT 6	121

FIGURE 9 APPROVED INSPECTORS' SHARE OF CONSTRUCTION WORK.....	138
FIGURE 10 EXAMPLE OF THE USE OF N-VIVO CODING.	146
FIGURE 11: NUMBER OF SITE VISITS FOR A CASE STUDY IN EACH DISTRICT	153
FIGURE 12: TYPICAL BUILDING CONTROL STAFFING STRUCTURE.....	155
FIGURE 13: BUILDING CONTROL OFFICERS CONTACT TIME AND OPINIONS.	164
FIGURE 14: REGULATORY THEORY.	169
FIGURE 15: EXTENSIONS INSPECTED.....	211
FIGURE 16: NUMBER OF SITE PROBLEMS	216
FIGURE 17: NUMBER OF BUILDING CONTROL PROBLEMS	216
FIGURE 18: NUMBER OF PROJECTS WITH BUILDING CONTROL PROBLEMS.....	217

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EXPLANATION OF TERMS USED

A number of denominations, terms and perhaps unfamiliar words which may be described as jargon are used throughout this thesis. Sometimes these terms are idiosyncratic to Building Control, but most are usually employed in general construction vocabulary as well. It is advantageous at this point to identify some of the key terminologies though further clarification is provided on the appropriate occasions in the content.

Approved Documents Each regulation is set down, and methods of achieving conformity are described and illustrated.

Approved Inspector: The name for private sector Building Control and the surveyors working in that sector.

Building Control Officer A person authorised to inspect construction work and check plans for conformity with the Building regulations. Sometimes called Approved Inspector, District Surveyor, Building Inspector, or Building Control Surveyor.

Building Notice Submission A method of applying for Building Control inspections and approval without having necessarily to provide drawings or have them formally approved.

Competent persons A person or company that is registered with an approved association that can self-certify certain works which will then no longer require an inspection by Building Control.

Conditional Approval Plans that are approved for conformity with the Building Regulations but have conditions attached that require the provision of further details and information to achieve compliance.

Full Plans Submission An application sent to a Building Control body with plans that require checking and are either approved, conditionally approved or rejected for conformity with the Building Regulations.

Site inspection A visit by a Building Control Officer to a project site for the purpose of regulatory inspection.

LIST OF ABBREVIATIONS AND TERMS

AI	Approved Inspector
AD	Approved Document
BA	Building Act 1984
BR	Builder
BRAC	Building Regulations Advisory Committee
BCA	Building Control Alliance
BCO	Building Control Officer
BC	Building Control
BN	Building Notice
BSI	British Standards Institute
CABE	Chartered Association of Building Engineers
CAD	Computer Aided Design
CIAT	Chartered Institute of Architectural Technologists
CIOB	Chartered Institute of Building
CIPFA	Chartered Institute of Public Finance and Accountancy
CITB	Construction Industry Training Board
DEBA	Devon Earth Building Association
Dom/Ext	Domestic Extension
DR	Designer
DIY	Do it yourself
DSA	District Surveyors Association
ESRC	Economic and Social Research Council
FENSA	Fenestration self-assessment scheme
FP	Full Plans
HO	Home Owner
HETAS	Heating Equipment testing and approval scheme
I Struct E	Institute of Structural Engineers
I.T	Information Technology
KRM	Kaleidoscopic Research Model

LA	Local Authority
LABC	Local Authority Building Control
LGA	Local Government Association
MTP	Microscopic, Telescopic, Periscopic
OECD	Organisation for Economic Co-operation and Development
PP	Planning Permission
Regs	Building Regulations
RICS	Royal Institution of Chartered Surveyors
RIBA	Royal Institute of British Architects
RTPI	Royal Town Planning Institute
SE	Structural Engineer
SI	Statutory Instruments
TA	Thematic Analysis
TUC	Trades Union Council
UK	United Kingdom
uPVC	Unplasticised Poly Vinyl Chloride
VAT	Value Added

ABSTRACT

Building regulatory control of Domestic extensions in contrast to volume house building and commercial projects manifests a propensity to consume more economic resources than that generated from fee income. In personal Building Control practice cost and efficiency savings were achieved through linear programming, economies of scale and new technologies but the problem remained. More efficient and alternative mechanisms for alleviating this quandary were required, and academic inquiry provided an opportunity. The current literature was reviewed and thereafter continually revisited. A kaleidoscopic research model involving different epistemologies and methodologies but combining microscopic and periscopic views was regarded as a pragmatic means to synergise the relationship between academic inquiry and industry. A preliminary practice based case study was conducted followed by interviews and archival retrieval at various Building Control units. The investigation was a heuristic trial and error research tool and sufficiently robust to form the foundation for the main research based on region-wide case studies, building surveys, interviews, and archive documentation. The empirical evidence established resource use overruns were found in all districts researched and up to half of domestic extension activity failed to cover fee income. The presumption of regulators and regulatees was that overruns were caused by the poor practices of inadequate Builders. Analysis of the data contradicted this sentiment and revealed the major cause was Designers' mistakes and to a lesser extent unexpected externalities, Building Control procedures, and Home Owners' revisions. Solutions are proposed and evaluated to overcome the challenges presented by these complications and remedy these causal incidents. Ways are explored and assessed that have practical application for Building Control bodies in achieving regulatory conformity within fee income for domestic extensions and be practically functioned. The research was limited to a single English region; to establish if the phenomenon is found nationally will require further inquiry.

Explicating Excessive Financial Resource Allocation by Building Control in Achieving Regulatory Conformity in Domestic Extensions

1.0 INTRODUCTION

1.1 Building Control perspectives

The first documented building laws (codes 228-233) were those of the Babylonian King Hammurabi c 1750 BCE (Harper, 1904). Rudimentary regulatory control was first decreed in England in 1189 and over the following centuries there were partial attempts to address local issues particularly regarding fire precautions. The Rebuilding of London Act 1667 came into force after the Great Fire of London but was specific to rebuilding within the old city walls. Other acts extended the jurisdiction into Westminster until eventually in 1774 all the built up areas of London were covered and District Surveyors established. During the nineteenth century, other large Local Authorities followed suit seeking legislation by Act of Parliament for their own locations. No legislation nationally was enacted concerning Building laws until the Town Improvements Clauses Act 1847. In 1858 model bye-laws were introduced permitting smaller Local Authorities to have some form of building regulatory control, if they so wished, without having the expense of seeking a separate act of Parliament. The Public Health Act of 1936 brought in new and additional model bye-laws but as these were guidelines only, variation in regulatory requirements still continued to exist between Authorities. In 1966, the first set of Building Regulations for England and Wales, apart from inner London, came into force and the old byelaws were superseded (Building Control Act 1966).

A detailed historical background, critical appraisal of Building Control and the legislation concerning the provision of the service has been written by Knowles and Pitt (1972). The authors were primarily concerned with the history of District Surveyors (the forerunner of present day Building Control Officers) in London, and their topic base emphasises specification standards, associated architecture, and urbanism rather than problems of implementation or finance. A different perspective is provided by Garnham-Wright (1983) who sheds light on the actual construction legislation and its influence within the United Kingdom but fails to position Building Control within a wider economic or social dimension. The work of Gaskell (1983) describes how in response to local and professional pressure bye-laws were used as a method of controlling buildings and urban development. He views Building Control from the point of view of national statutes and their influence within the local community and holds a local administrative perspective rather than a national one. Harper (1978) provides a comprehensive coverage of the Building Regulations from its rudimentary beginnings in the nineteenth century up until the early twentieth. He analyses the factors that affected Building Regulation legislation and, in turn, the influences on subsequent building forms within the UK. Similarly, Ley (2000) continues in this historical setting and brings the depiction up from the position where Harper terminated and maintained the analyses in the same vein up until the 1990s. The aspects of enforcement, costs, resource allocation, and actors' participation lay outside the scope of their inquiries.

The primary function of the Building Control service is to control construction work that is subject to the Building Regulations (Building Act 1984). The legislation ensures people are safe in and around buildings and that these structures are accessible and environmentally friendly. Compliance is achieved through inspection of works and approval of plans by Building Control Officers, often referred to as Building Control Surveyors, or in the vernacular as Building Inspectors. In London the term historically used is District Surveyor.

The Building Control role in England, from its inception until over three-quarters of the way through the twentieth century, was solely the responsibility of Local Authority (Gaskell, 1983). Inspections and plan checking and all other aspects of Building Control were originally provided free to the end user, and costs were met from the general rates. Change came about in 1985 when charges for the service were introduced and competition was permitted by the provision of private Building Control through the creation of Approved Inspectors (Building Act 1984, s.49), who undertook the same role as public sector Building Control Surveyors but through a private insurance based system, *with no legislation governing levels of service or fee charges*. Local Authority Building Control departments were required to charge fees for the first time, which were determined in accordance with Central Government directives (Building Act 1984, s.1; Building (Prescribed Fees etc) Regulations 1985, SI 1985/1576). This meant that finance units of individual Councils had a new source of income and the revenue from the general rates previously used for financing Building Control could be used elsewhere. This change also presented Councils' accounts departments with an opportunity to charge their Building Control units for in-house services. Items such as computers, accommodation, personnel, and legal services could be recharged above the market rate, providing a tempting prospect for those Authorities, who so desired, of the possibility of diverting any fee surpluses that accrued to make up losses in departments in deficit. Pressure on Building Control bodies' to resist this approach was particularly pertinent after subsequent legislative changes by Central Government permitted fee setting by each Authority without restriction. However, Local Authority Building Control bodies were legally supposed to cover only their actual running costs, operating within a plus or minus 5% margin (Building (Local Authority Charges) Regulations 1998, SI. 1998/3129). Nonetheless, the categorisation of fee types into three sections continued. *Category A/table1* new dwellings, fees were still set out and open to negotiation taking into account economies of scale on volume construction. *Category B/table2* domestic extensions were non-negotiable

the only category to be so. *Category C/table3* non-domestic works whose cost were based on project costings were also negotiable.

Table A	New Dwellings (up to 300 m²)		
Number of dwellings	Charge £	VAT £	Total £
1	680.00	136.00	816.00
2	935.00	187.00	1,122.00
3	1190.00	238.00	1,428.00
4	1445.00	289.00	1,734.00
5	1700.00	340.00	2,040.00
6	1912.50	382.50	2,295.00
7	2125.00	425.00	2,550.00
8	2337.50	467.50	2,805.00
9	2550.00	510.00	3,060.00
10	2762.50	552.50	3,315.00

Table B	Small domestic buildings, extensions and loft conversions		
Type of Work	Charge £	VAT £	Total £
Conversion of garage in to living accommodation	208.33	41.67	250.00
Garage and Car Ports up to 40m²	208.33	41.67	250.00
Electrical works (Non Competent Persons Scheme)	291.67	58.33	350.00
Garage and Car Ports over 40m² up to 60m²	291.67	58.33	350.00
Extensions and Loft Conversions up to 10m²	375.00	75.00	450.00
Extensions and Loft Conversions over 10m² up to 40m²	458.33	91.67	550.00
Extensions and Loft Conversions over 40m² up to 60m²	541.67	108.33	650.00
Extensions and Loft Conversions over 60m² up to 80m²	625.00	125.00	750.00

Table C	Calculation of charges for all other building work		
Total Estimated Cost £	Charge £	VAT £	Total £
0 - 1,000	106.67	21.33	128.00
1,001 - 2,000	170.00	34.00	204.00
2,001 - 5,000	212.50	42.50	255.00
5,001 - 10,000	255.00	51.00	306.00
10,001 - 15,000	297.50	59.50	357.00
15,001 - 20,000	340.00	68.00	408.00
20,001 - 30,000	425.00	85.00	510.00
30,001 - 40,000	510.00	102.00	612.00
40,001 - 50,000	595.00	119.00	714.00
FOR PROJECTS WITH AN ESTIMATED COST OVER £50,000 PLEASE CONTACT US FOR ADVICE			

Replacement windows (dwellings only)			
	Charge £	VAT £	Total £
Replacement windows	101.67	20.33	122.00

Figure 1: Categories of works.

The greatest income sources for most Local Authority Building Control bodies are industrial and commercial schemes (Communities and Local Government, 2015). The revenue from these large-scale operations can be extensive and have the potential possibility of cross-subsidising smaller projects where a loss may have occurred. *Category B/table 2* which includes domestic extension was based on area square meterage rather than project costs. This grouping is designated for the small works element of the three categories and includes standard charges for alterations, garages, window replacements, and service installations. However, domestic extensions are the major component of this class. Crucially Local Authority Building Control had to locate its standard charges for domestic extensions on the cost of the average time spent in checking a plan and undertaking the five statutory site inspections that are required. These pre-determined standard costs are an expediency because extensions vary in construction complexity and on-site conditions. When unexpected problems requiring extra inspections or resource allocation above those set down for the standard programme a financial deficit to the Authority is likely to occur.

The voluntary agreement between Local Authorities and the Department of Communities and Local Government operated by the Local Government Association for annual monitoring for compliance was suspended in 2007. New regulations were enacted through the Building (Local Authority Charges) Regulations 2010, SI. 2010/404 which were claimed by the Government to be more flexible, fairer, accurate, and transparent. They permitted Authorities to dispense with fixed fee charges, if they wished, and negotiate fees individually thus acknowledging the variety of complexity sometimes found between extensions. Local Authorities were not to make an excessive surplus or profit on their charges as this could be seen as indirect taxation for which Building Control Authorities have no statutory authority (DETR, 1998). The aim was to make Building Control self-financing over a three year period with monitoring taking place on an annual basis. There could be no more deliberate cross subsidisation, and Local Authorities had to publish their average hourly rate (Evans, 2010, pp.35-36).

In the late 1980s private sector Building Control was in its infancy, so the competition was limited (Ley, 1990). By the mid-nineties, Building Control bodies run by private enterprise (Building (Approved Inspector) Regulations 1985, SI. 1985/1066) had become more firmly established and gradually expanded to gain a greater share of the major projects, moreover often instituting association and relations with Designers and Contractors nationwide unrestricted by municipal boundaries or restrained in growth capacity. Potential profit margins are greater in large project works due to economies of scale. Approved Inspectors' operated with lower overheads, bought their services and office facilities on the open market, were unencumbered by corporate bureaucracy, and not subject to political accountability (O'Connor, 2014). They had the option to pick and choose work and could set up in practice wherever they deemed fit (Communities and Local Government, 1985) often they had regional or national office locations which permitted them to attain a more favourable competitive position than Local Authority Building Control bodies could achieve. The public sector continued to maintain the majority share of the domestic extension market. Approved Inspectors had little interest in these small scale projects because potential profit returns were marginal and often uncertain. With the downturn in the construction industry, private sector regulators sought more of the domestic share of the market to make up for their diminishing workloads within the industrial and commercial sectors. There were unsubstantiated accusations from public sector employees that they were buying in work just to cover their overheads. Some Local Authority Building Control budgets became constrained as they started to lose this category of work (Communities and Local Government, 2008a). This gave rise to fear within some Authorities that they would be left with very minor, difficult, or unprofitable jobs that Approved Inspectors did not want, the public sector being ultimately the inspectorate of the last resort (Building Control Alliance, 2009).

Building Control finances were influenced not just by commercial forces but sometimes by Council Members who did not wish fees charged to Home Owners to rise too rapidly for reasons of political expediency (North Devon Council 2012). The enforcement function was a further potential pressure on budgets as this activity remained the sole responsibility of the Local Authority (Building Act 1984, s. 49). If an Approved Inspector is unable to achieve compliance the Approved Inspector withdraws the initial notice that was submitted on behalf of the client at the commencement of the project, and it is re-assigned to the Local Authority for legal enforcement (Building Act 1984, s. 52). Local Authority Building Control wears two hats; firstly, the professional regulating Surveyor, and secondly the enforcing bureaucrat (Clarkson, 1988). Legally, remuneration for enforcement work or any litigation action that a Local Authority Building Control discharges on its own behalf should come from the budget of the Authority's revenue department, and not from fee income of any Building Control works (Building (Local Authority Charges) Regulations 2010, s. 5. SI. 2010/404). If Authorities' legal departments fail to be remunerated by their finance departments they recharge Building Control units for their work which are then penalised in fiscal terms by having to bear the costs from within their own units' budgets.

Coinciding with the liberalisation measures in 1985 of charges for the service and private competition, the building codes themselves were fully rewritten. The prescriptive based Building Regulations from the 1960s which set out exact requirements and standards for construction purposes were withdrawn. Approved Documents (Parts A-L, at that time) replaced them, and new performance-based codes were introduced. The Approved Documents set out the regulations and provided details of various ways and options of meeting their requirements. The move away from *legal* norms to more *technical* norms shifted the regulatory focus, "no longer on how compliance is reached, but that compliance is reached", Supiot (2007) cited in Van der Heijden and de Jong (2009). These reforms precipitated a monumental paradigm shift in the attitudes of Building Control Officers employed within Local Authority (Hawkesworth and Imrie, 1989). Not only

did they face competition for the first time but they were required to justify their income and expenditure to their respective finance departments. Moreover, Building Control Officers themselves were required to have far wider expertise and knowledge of construction processes. They were now operating in a competitive market, in an industry that was experiencing technological change, and had the additional responsibility of interpreting as well as implementing the codes. Public Building Control bodies, unlike those in the private sector, also have non-fee earning duties, to administer dangerous structures, demolitions, entertainment licences, safety in sport's grounds, plus cinema and theatre inspections. Further, Building Control bodies are permitted to carry out building related work for other departments and agencies.

1.2 The problem

As a practitioner for over twenty years in Local Authority Building Control the author has frequently sensed there is disproportionate financial resource allocation in practice for domestic extension work compared with volume house building (sites of more than four units), conversions, industrial, and commercial projects. This assumption was held by colleagues within Building Control practice and supported tacitly when engaging with different Surveyors at seminars and conferences. It was also alluded to over a period of years in professional journals such as the *Builder*, *Building Engineer*, and the *RICS Building Control* (Morgan, 2013, pp. 6-7). Scrutiny of past accounts indicated that fees charged for some domestic extension projects failed to cover the actual cost of the service.

In 2008, there was an overall decline in the construction industry (Gerba, 2009) reflecting the Global economic downturn. This slow down consequentially had a direct impact on the number of clients submitting Building Regulations applications for construction projects (Communities and Local Government, 2015b). A period of economic austerity had meant competition from Approved Inspectors intensified as both private and public

Building Control bodies competed in the marketplace for a share of a diminishing workload (ACAI, 2014). Regulatory practitioners have to look critically at all areas within the Building Control system where there may be financial leakage. One cause of concern was the expense of additional unprogrammed inspections combined with ensuing correspondence and communications which are key factors whether a project's fee income covers the cost of the provision of the service. Large and complicated construction enterprises require numerous inspections, and therefore, any extra site visits can be contained within the negotiated fee for the project. Due to the magnitude of this type of work, an additional site inspection renders only a marginal difference to the total time and resources allocated to inspecting and dealing with a project (Hoffman et al., 2007). These economies of scale are not relevant to minor projects. Therefore, additional resource use has a far greater influence on budgetary outcomes. Fee scales for these small works were previously based on square meterage rather than actual construction costs. Once the fee scales for domestic extension schemes had been published and set, no adjustments or alterations were permitted to the charges laid down until they were reviewed at the end of the financial year. Consequential losses for practical purposes may have to be made up from profits from other jobs resulting in a form of cross subsidy from third party clients which are not permissible under the new legislation (Building (Local Authority Charges) Regulations 2010, SI. 2010/404) because each project should cover the actual cost of providing the service. .

Building Control Officers can spend substantial amounts of time in achieving compliance by offering advice, providing information, through negotiation, and finally by threats of legal proceedings. Consideration of these activities and the risks of additional work are factored in when Building Control and finance department managers agree on the fee scale rates (Abdul-Rahman et al., 1996). Domestic extensions in comparison with commercial, industrial, or volume housing developments, are usually elementary in design and complexity. Five statutory inspections are designated for these type of projects (Building Act 1984) which are generally sufficient for this

type of minor works and Local Authority Building Control bodies base their inspection regimens on these requirements (Lane, 2007). It should be noted; there is no legislative duty on Authorities actually to inspect the works only a duty laid on the applicant to notify the Authority when a statutory phase for inspection has been reached (Building Regulations 2010, s.16, SI. 2010/2214). Once a domestic extension project commences but requires supplementary inspections and more economic resources use than those accruing from the fees, then costs are certain to overrun having regard to the stringent financial margins that Building Control bodies are legally required to operate within.

Part of the problem of extra resource use was the way fees were set to cover operational costs, particularly in the past. A summary has been given in Building Control Perspectives (1.1) above. Fees charges are determined to cover the cost of inspection visits, the plan checking component of the application and all other departmental overheads. Relative running costs can easily be computed, and the fees for this particular feature can be proportioned quite exactly. Plan checking is usually a straight forward operation in projects of this size and the time committed to this activity can be calculated reasonably accurately. One unexpected and additional site visit to a domestic extension potentially increases inspection costs by up to twenty percent (based on five inspections per project). To work within such unpredictable parameters can be a potentially difficult exercise particularly when aiming to conform to statutory requirements, prevent cross subsidisation, and attempt to achieve economic resource allocation equity. Since the commencement of the present research Local Authorities have subsequently been granted power to recover additional costs on projects (Building (Local Authority Charges) Regulations 2010,c. 11.4 SI.2010/404). Fees for legitimate extra work entailed, for whatever reason, than originally programmed can now be reclaimed. They now possess the legal means to achieve cost neutrality on each project if there is a fee overrun. The auxiliary payment must come from the Home Owner on whom the legal responsibility for the project rests. Builders or Designers cannot be recharged even if the

additional work Building Control incurred is due to their fault or negligence. This is a potential problem for Home Owners as their only remedy for reimbursement for negligence on the part of their agents is to seek civil action against them. These new powers may go some way to alleviate the resource use and cross subsidisation problems after construction commences but do not prevent the causes of additional work and the ensuing overruns.

In practice, the departmental focus has been to achieve budget neutrality as required by law on each project. Even if fees are set on project costings rather than square meterage, only a fixed amount of inspections can be carried out before there is a budgetary overrun. Due to the variety and small scale nature of the work (in category B) any complications and variations that occur have disproportional effect on costs, (Drew et al., 2001, pp. 397-399), in comparison with projects in categories A and C. Finding explanations, reasons, and the causes of why additional inspections and the resulting paperwork transpire will help provide solutions to this quandary. If domestic extension regulatory work could be positioned so that no supplementary resources were required above those programmed, then Building Control activity could remain within the set financial parameters. In the researcher's own practice accomplishing fiscal neutrality on each project has proved difficult, a variety of opinions have been expressed by Building Control Officers involved as to why this should be. The problems could be location specific due to unique features of the district, flawed accounting procedures, or bad Builders. A number of further explanations have been postulated over time, but the problem has never been fully addressed and no serious effort has been attempted to eradicate this dilemma. In personal practice departmental operations have had a macroscopic focus rather than addressing issues at a microscopic level. Concentrating on the broad and wider regulatory issues has been a less demanding option where time is at a premium. The executives of Local Authorities view responsibility for addressing overruns, conforming to statutes and Central Government guidelines as lying with the unit management. Individual Building Control

Officers though have to ensure each project they supervise conforms to Building Regulations. If undertaking those duties additional inspections, plan checks, structural calculations, and associated documentation has to take place then there is no alternative but to undertake them. The main intention should be to achieve conformity without these unexpected elements occurring but until a project is complete there is often no accurate means of fully knowing the final resource outcomes. The key question is why these irregularities materialise on one scheme and not on another. The alleviation of these specific difficulties in practice can only be addressed, and remedial action determined after the origin and grounds for these hindrances are positively and empirically identified.

1.3 Research aim

To formulate procedures to introduce efficiency improvements based on a comparative evaluation of the factors that at times cause additional resource overruns by English Building Control bodies during the process of carrying out statutory functions in respect of domestic extension works between 10m² and 80m² in area.

1.4 Objectives

- 1.To determine if extra financial resource allocation above that programmed for in achieving regulatory conformity in domestic extensions by Local Authority Building Control is more than a localised phenomenon.
- 2.To deduce the extent of extra financial resource allocation above that originally assigned by individual Building Control bodies and its extent geographically
- 3.To generate mechanisms that will lead to the active and positive identification of the factors and agents that cause additional financial resource use over that programmed.
- 4.To assess critically the significance of any identified factors and agents that cause or influence extra resource allocation in domestic extensions and ascertain the degree of potential impact and connectivity they have on the problem.
- 5.To furnish possible solutions that might be required to remedy the problem and provide a beneficial advantage to Local Authority Building Control.
- 6.To explore the means by which these solutions can be brought to fruition and evaluate procedures for practical implementation and utilisation.

1.5 Contribution / significance

A number of initiatives to modernise Building Control inspection and enforcement procedures have been investigated and/or suggested over the past few years (Communities and Local Government, 2008a). The current economic situation and the contraction of the construction industry have particularly focused the mindsets of senior management within the public sector towards encouraging the continuation of the search for cost-effective efficiencies and possible solutions (Andrews and Boyne, 2009). From tacit knowledge gained by the author, it is apparent that efficiencies in work practices, organisational procedures, and other effective improvements are actively discussed by individual Building Control unit management with their respective finance departments, executives and, councillors. However, problematic externalities cannot be addressed on an ad-hoc Authority by Authority basis, and therefore, are left to the investigation of external formative groups. These organisations are nationally based and include the District Surveyors Association, RICS Building Control group, BRAC, and the Department of Communities and Local Government. Input and suggestions emanate from the Chartered Association of Building Engineers the Building Control Alliance and similar organisations all of whom have a broader outlook than a localised Building Control body but share some common purposes.

A plethora of advice, suggestions and announcements have emerged from these groups and organisations over the past decade concerning control and regulation. Better guidance and limiting changes to the Regulations to a three-year review and commitment that any regulation will not be modified more than once every six years (Communities and Local Government, 2009b) have been proposed as a method of aiding financial resource allocation. User-friendly regulations and a simplified approach to small domestic buildings (Building Regulations Advisory Committee, 2007) are

further suggestions for improving performance standards. The Royal Institute of British Architects made proposals for reform of the Regulations too (RIBA, 2006). New initiatives to improve house building skills are additional recommendations advocated which could help construction processes generally and perhaps indirectly improve the inspection regime of Building Control (Building Regulations Advisory Committee, 2010).

Neither at the micro or macroscopic level has it appeared that any of these particular avenues or ideas have been corroborated by substantive empirical research. No case studies have been ventured nor does it seem that documentary evidence has been collated. Most work materialises from committee based discussions or is underpinned by responses to random questionnaires. The indication is that Building Control Officers, allied construction organisations, other Local and Central Government bodies are formulating their own propositions and designs from inferential knowledge, practical experience and interaction with fellow actors. There is a gap in the knowledge concerning the problem of financial overspends in a proportion of domestic extensions that are regulated by Local Authority Building Control. The present inquiry aspires to contribute to the Building Control segment of the regulatory function within the construction industry by providing proven knowledge of a subject that has not previously been researched and which can form the basis of a rational adjustment to procedural systems in practice.

2.0 REVIEW OF THE CURRENT LITERATURE

2.1 Introduction

The primary purpose of transacting the literature review was to establish an approach in which to analyse and then synthesize current readings and scholarship for the research study. To achieve this goal three important themes emerged as the reading and evaluation progressed. These themes have been used as a foundation in conceptualising the review as the author strives to evaluate the literature by moving from the general to the particular. These include combining personal professional knowledge of the built environment with academic perspectives on this subject and developing this synthesised knowledge into a base on which the methodology and research could be founded. Reflecting on all these influencing sources, a picture emerged that these three broad generators which impact on project outcomes are often common to other industries that have regulatory control. Thus, the review draws on a wide spectrum of literature besides that of the Built Environment, using research and knowledge from other disciplines.

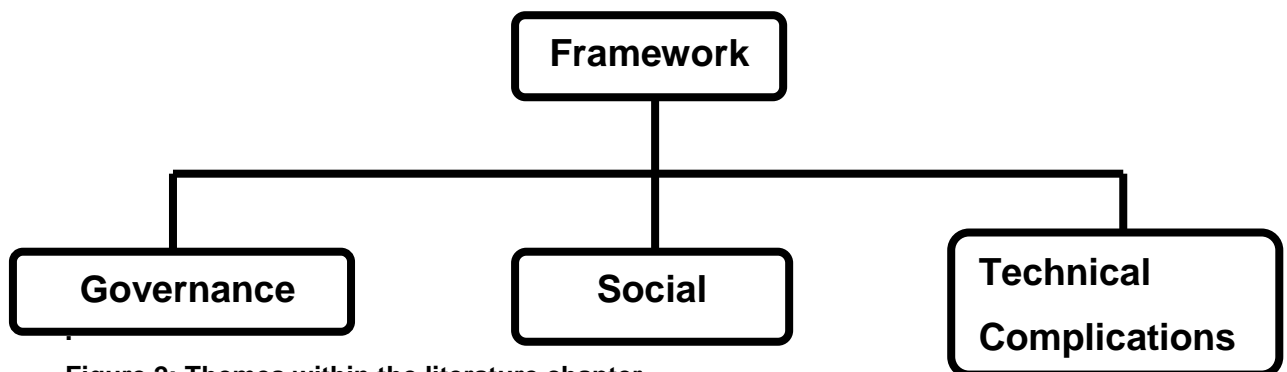


Figure 2: Themes within the literature chapter.

The review commences by establishing the paucity of research specifically related to Building Control in England. It then proceeds to determine what has been written concerning factors that influence achieving compliance with regulations and codes, examines different styles, and types of regulation and application procedures. It looks at various regulatory industrial regimes besides construction and views the psychology and corporate behaviour of organisations of differing magnitude. These include different types of administering Authorities both within the UK and overseas. This comprehensive approach has been selected to cover a broad range of organisational establishments for comparative purposes and to focus on the dichotomy which often arises of endeavouring to achieve the goal of regulatory compliance without the problem of undue economic resource over-runs. This theme has been designated under the broad term of **Governance** referring to the process of governing either by local or national governments or corporations and businesses in the private sector. There are divergences, but all have a degree of commonality in that actions, rules, and norms are generated but sustained and held to account.

Anthropological investigations into human action together with the social influences on actors that impact on regulatory outcomes form part of the second theme. The focus shifts from regulations, administration, corporate and commercial bodies to distinct actors operating within the various systems. It seeks to comprehend their underlying individual motivations and how human attitudes and actions may condition outcomes which may also influence resource overruns. The participant range is drawn from both the regulators who enforce the codes and the regulatees who have to conform to the regulations. Focusing in depth on these two differentiating sets, on the regulatory side, these actors are explicitly the Officers who are responsible for ensuring statutory conformity. On the regulatee side, they are the ones who are responsible for the commission, design, administration, and construction of the works. This theme has been labelled **Social**.

The third theme is **Technical complications**. Failures of material is an illustration of how difficulties may occur that give rise to problems in achieving compliance with the regulations governing many industrial processes but lay outside the dominion of the two earlier themes. Foundation conditions, concealed elements, and the weather are further examples of issues which can be specific to construction that do not necessarily have direct cause or connection with topics concerning governance or social actions. Therefore, within the review, this third general avenue is pursued in the light that all possible and conceivable factors are investigated and explored in the quest for the discovery of the influencing constituents that cause the use of additional financial allocation in obtaining regulatory compliance.

These thematic expositions were subject to attenuation as the review proceeded because the chosen focus of the research is only on the domestic extensions segment of the construction industry (up to 80m² as outlined in table B fig1. P.5). The review is a dynamic analysis and a continuum covering the relevant topics over a period of some thirty years, pointing the direction and laying the foundation in which the author proceeded to embark on the research.

Only research written in English was explored.

2.2 Research background

Concerning contemporary research into the influences and challenges facing Building Control in England, an exploration of the literature revealed a famine in inquiry regarding this subject area. This was reinforced by Van der Heijden (2009a, p.38) who analysed 2800 articles regarding construction from 1997-2007 and concluded that only fifteen concerned Building Control, that is the statutory bodies that are responsible for enforcing the Building Regulations. An investigation undertaken on behalf of the Building Research Establishment into volume house building found, 'Levels of compliance were

not always sufficient' Baiche et al. (2006, p. 279) though they found no evidence of systematic or purposeful non-compliance with the Building Regulations. They claim that prior to the publication of their work, no reliable proof of the scale and extent of Building Regulatory non-compliance in the U.K. was ever researched or recorded. These are surprising revelations considering the amount of research undertaken within other areas of the construction industry. As the literature is limited concerning the specific levels of building regulatory non-compliance and the Building Control function itself, alternative avenues have had to be explored. Initially, the reviews' scope envisaged recourse to allied and related fields of regulatory procedural measures and methods for ensuring compliance in areas outside of the construction industry, and this now appears even more worthwhile. These elements are combined to form a foundation on which the research programme can be based. The relevance of working from the general to the particular from the literature surrounding the three themes already outlined will be tested by the outcome of the study.

2.3 Governance philosophical and theoretical concepts

The theory of governance provides an organizing framework for what may be broadly termed public administration but is place and date specific. Lobel (2004, p.343) states that Governance is not now regarded as a synonym for government, it is a change in the meaning of government, referring to a new process of governing: or a changed condition of ordered rule and assumes that a new model of governance can achieve better compliance. Stoker (1998, p.19) contends it is primarily drawn from the Western democratic experience arguing there is agreement amongst academics that it refers 'to the development of governing styles in which boundaries between and within the public and private sectors become blurred' and that the term is used in a variety of ways. Rhodes (1996) agrees and thinks the term is imprecise and a vogue word arguing that governance refers to self-organising and inter-organizational networks while maintaining that the

British Government's administrative ethos has changed. He reasons that reform and adoption of new dogmas and doctrines since 1979 are a continuing and ongoing mechanism but considers it is a new method by which society is governed. According to Hirst and Thompson (1996, pp.170-194), the era in which politics could be conceived in terms of processes within nation states is in transit. They claim politics has become polycentric and that nation 'states are one level in a complex of overlapping and often competing agencies of governance.'

2.4 Current type of regulation

Most European and English-speaking countries have changed to performance based Building Regulations (Van der Heijden, 2009a, pp.42-43). These are regulations that set down the standards that are required to be met in contrast to prescriptive codes which set out how the construction is to be carried out. Meacham et al. (2005) have questioned the overall accountability of Building Control because of the severance of this link between the codes and procedures. Prescriptive types of code avoided the awkward tasks of dealing outright with societal aspirations. In the past, this had led to frustration by Designers who often had little scope for innovation and as Imrie (2004, p. 423) contends 'regarded regulators actions as going by the book.' The need was for 'Goals and objectives that reflect societal expectations and desires along with functional statements, operative's requirements and in some cases performance criteria', IRCC (1998, p. 7) reinforces this notion. The introduction of performance-based Building Regulations in England occurred in 1985 (Building Act 1984) and marked the almost complete abandonment of the old prescriptive codes. The former 'draws its force from the scientific knowledge of an object it intends to put to use'; the latter 'draws its strength from shared faith in the projected realm that the norm aims to realise' Supiot (2007) cited in Van der Heijden and de Jong (2009, p.149). 'Successful introduction of performance-based codes must be accompanied by well-focused training programmes including regulator and regulatee' states Duncan (2005) who argues that just putting

documents before the industry does not lead to successful implementation. According to Pilzer (2005) besides their impact on the regulators, performance-based regulations encourage a variety of solutions to achieve compliance with regulatees helping to promote innovation in building products, methodologies, and international trade. Similarly in the United States over thirty years ago Schodek (1976) wondered why construction professionals did not demand a more active role in shaping performance regulations as they are 'typically part of their professional concerns.' However, in Australia, there have been serious moves to perfect the regulations (Best Practice Annual Report, 2006) by moving back to more prescriptive codes. The stated reason for this action was that minor projects do not require innovative skills, and small contractors would prefer to know how to meet the building codes explicitly expressed.

2.5 Alternative types of regulation

As an alternative to the present performance and the old prescriptive codes the use of system based regulations which bridge the gap between the extremes of these two types of regulatory mechanisms has been advocated. 'Firms produce plans that comply with the general criteria designed to promote the targeted social goals' states May (2007, p. 10). The focus of this kind of regulation is on a process rather than an outcome or results. In Switzerland, Flueler and Seiler (2003) evaluated the approach of replacing deterministic prescriptive regulations with probabilistic regulations. Their work did not involve the construction industry, but its overall goal was to achieve greater safety at reduced costs through the adoption of risk-based regulations which are an agency and means for balancing cost effectiveness to the probability of risk. A monitoring based regulatory system has also been suggested to overcome the constraints of bureaucratic monitoring, a method that checks the adequacy of the management system only. The aim is to achieve public goals through the flexibility of the management system but in areas where outputs are difficult to monitor (Coglianese and Lazer, 2003), which is not the case in domestic extension projects. An old scheme

revisited by Hahn and Stavins (1991) is for Government to provide economic incentives to encourage regulatees to conform. This may work in areas such as the Clean Air Act 1956 by financially aiding people to change fuel systems, but it is hard to understand how it could be successfully implemented in the construction industry. Responsive regulations are an alternative type of regulatory action which seeks a moral commitment to abide by the law. However, Parker (2006, pp. 591-622) feels a compliance trap occurs 'when there is a lack of political support for the moral seriousness of the law it must enforce.' If actors perceive regulatory enforcement as invalid, they lobby for change and the regulator avoids conflict by opting to enforce more leniently. In other words, large conglomerates involved in construction, for example, contractors and material manufacturers, may view certain regulations as unwarranted. They may form pressure groups to dilute or abandon certain regulations and statutory controls which in contrast may be perceived by other groups or bodies as being in the general public interest.

Doyle (1997) identifies 'two industrial forms of regulation, one imposed by statute (statutory regulation) and a second arising from voluntary agreements (self-regulation).' He states the benefits of self-regulation are the provision of product information, cooperative action to initiate standards, and protection from bad practice. Andrews (1998) questions Doyle's positive assessment by responding that there is evidence of self-interest illustrated by the ways some bodies restrict membership to establish a market scarcity and thereby keep consumer costs artificially high. In the Netherlands, self-regulation has been introduced for Architects and technical advisers. Sheridan et al. (2003) predict the changes in Holland will be an advantage to large businesses as they could have an opportunity to develop new working methods. Visscher and Meijer (2002) though enthusiastic about self-certification as a way forward in efficiency, quality, and costs, refrain from any extensive comment about the negative issues. Certainly in the nuclear industry, this shifting of responsibility to the regulatee has caused grave concerns regarding safety issues indeed Barkenbus (1983) wonders if self-

regulation is possible at all. An alternative view is offered by Aalders (1993) who is confident self-regulation is practical as long it is accompanied by stringent enforcement policies but omits to detail if these should be imposed within the private or public domain or both.

Whatever types of regulations are in operation or introduced certain regulatee interest groups or elements will ascertain them as contentious claiming they stifle innovation. Meacham et al. (2005) highlight the challenges in adequately defining and identifying performance based codes. Gann et al. (1998) concur with their observations by making similar comments specifically regarding regulatory instruments that they should remain valid across international borders but without compromising societal and local norms. Seall (2004) makes a similar case regarding prescriptive regulations; Knut (2012) demonstrates regulatory influences on innovation across other types of regulations especially in OECD countries. All regulatory frameworks bring their own tensions, benefits and disadvantages to varying degrees. The present research focuses on and functions within the compass of performance-based codes which are the current type of Building Regulation in operation in England.

2.6 Regulation and Deregulation

The British Government's stated aim was to save businesses £6.5bn during the period 2010-2015 (Communities and Local Government, 2009b). This was to be achieved through improved governance, part of what Hoggett (1996) terms centralized decentralisation and extended forms of performance management, which have been the main feature of Central Government policy for over thirty years. The Government is enthusiastic concerning de regulation (e.g. Building Act 1984 as amended by the Deregulation Act 2015, Communities and Local Government 2010a). In the document a Route to Better Regulation (Communities and Local Government, 2009b) initiatives were introduced for Building Control to improve electronic communications, enhance guidance material and

encourage targeting priority projects. While the Government's commitment is to improve regulations and streamlining regulatory control, its thinking concerning alternative and different types of Building Regulations is not outlined in that document. Ongoing engagement is reflected throughout all Government departments by the establishment of a better regulation unit, a better regulation delivery office, and a better regulation executive (Better Regulation Framework Manual, 2015). The regulatory policy committee is committed to challenging red tape, review regulations, and assess regulatory impact. Government policy subscribes to performance based Building Regulations which are the codes in current operation, and there is no indication of a change to other forms of regulation.

The seminal work of Ayer and Braithwaite (1992) helped establish the political ideology concerning the deregulation debate. Their philosophy supposes that private enterprises are more efficient than state-controlled bodies and has retained its hegemony since the stalemate concerning the state versus the free market for two decades. 'Knowledge begets social interaction' contends King (1988, pp.197-209) championing public interest theory whereby he argues a rational and enlightened state cannot actually regulate. He views regulation as an ongoing conflict either helping or harming the public interest and helping or harming the regulated party in different possible combinations. These are demonstrated in the diagram figure 3 below.

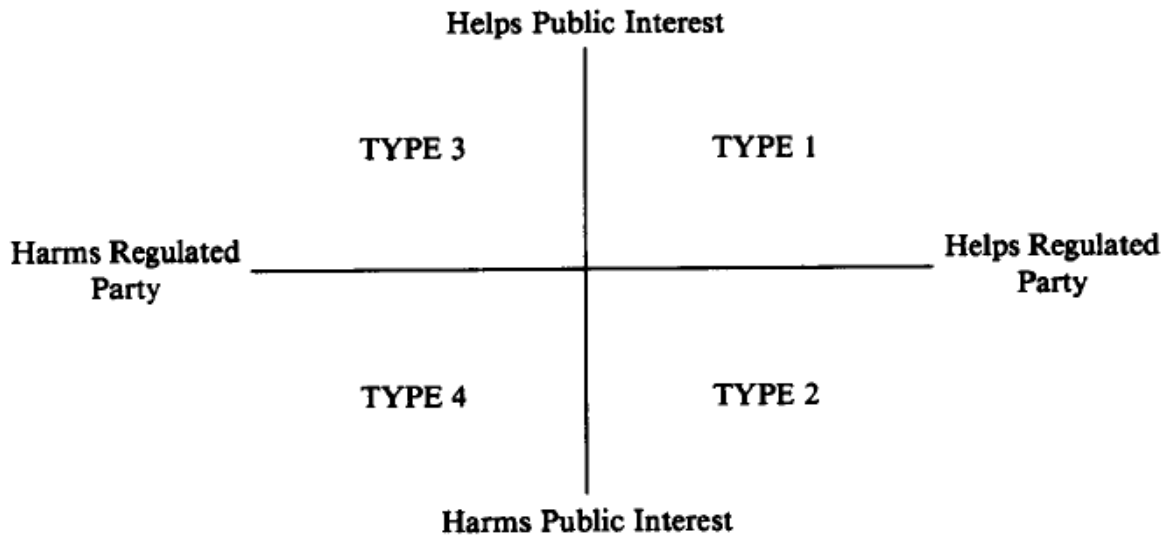


Figure 3: Regulatory harm and benefits configuration.

A type 1 solution would be the ideal, aiming to benefit both the regulatee and the public interest, a principle that might have a positive influence on additional regulatory resource use over that programmed. Limited resource time means this concept has to remain purely theoretical as far as the present study is concerned but is a worthy avenue of future investigation. Imrie (2004) intensifies this debate by arguing that there is little knowledge how regulations will achieve government construction objectives. In his later paper Imrie (2007) demonstrates that regulations are more than a technical activity rather they are entwined and are constitutive of professional practices. Calls to cut regulation as a spur to construction (Klettner, 2012), to make bonfires of them as suggested by Hemsley (2013), or simplify them as proposed by Klettner (2013) reveal how contentious regulatory issues can be. Though these authors provide evidence of difficulties for construction professionals, there is no indication by them of regulators' concerns regarding resource overruns or if these occurrences are indeed attributable to variances in the type of building codes. The actuality of regulatory change requires re-alignment across a wide range of fronts. Mackenzie and Lucio (2005, pp. 499-517) acknowledge this when they postulate a change in the regulations belies any notion of unproblematic transfer of responsibilities between actors. 'This is because regulatory change involves alliances and linkages across a range of spaces and

actors, contingent upon the peculiarities and limits of different states and their respective civil societies.'

2.7 Private and public control

From a global perspective, the responsibility of the Building Control function and enforcement has been traditionally undertaken by government agencies, a view supported by Meijer and Visscher (2001). However, there are now forms of private sector Building Control in Australia, Canada, New Zealand, and some European states (Meijer et al., 2002). The territory of commercial enterprise occupies a role partially vacated by the government through privatisation legislation enacted over the past twenty-five years in many advanced capitalist economies. In England, there is now both private and public control but only governmental enforcement (Communities and Local Government, 1985). Local Authority Surveyors regarded the entry of private sector Building Control as a wake-up call (Hawkesworth and Imrie, 2009) and this initiated a debate in the changes of the style of service and delivery. The shock to the system confirmed the earlier views expressed by Bish and Ostrom (1973), supporting the elimination of this natural monopoly, they contended that Government organisations operating under lax conditions have little incentive to innovate or reduce costs. Pragmatically Morgan and England (1988) writing shortly after the introduction of Approved Inspectors (the term used for private Building Control Surveyors), thought it did not matter who delivered the service as long as government retained ultimate responsibility for enacting legislation. Van der Heijden (2008) claims that aggressive private sector enforcement should lead to greater compliance with public regulations, suggesting enforcement agencies become more efficient as the number of breaches of regulation declines. According to Landes and Posner (1975), the private sector has to detect non-compliance to generate income; Van der Heijden (2009a, pp.65-66) gives credence to the notion that as the number of offences detected reduces so the chances of being caught rises. However, it could be counter argued that the opposite is true. Private Building Control surveyors may

possibly be more lenient and accommodating regarding their enforcement policies and less onerous in their interpretation of the legislation and rules to gain or conserve their market share of workloads. In other words by failing to introduce enforcement measures they thus avoid upsetting or alienating their client base. This argument has no foundation in any of the the literature reviewed. Varying distribution of public and private sector involvement in Building Control from country to country complicates direct comparisons between different nation states. Van der Heijden (2009b, p.3) points out governments describe their own regulatory arrangements in different ways, resulting in labelling similar arrangements differently and different arrangements similarly.

2.8 Local government

Local Government entities are often conscious of the high expectations the general public have, but are also aware of council tax payers' distrust due to their perceived lack of efficiency (Andrews et al., 2005). The food, environment, mining, and similar industries as well as construction all experience difficulties in enforcing regulations (e.g. Fairman and Yap, 2004; May and Winter, 1999; Gunnigham, 1987; and Lobel, 2004). Some control and supervision appear inherently beyond governance. 'The gulf between community aspiration and the perceived limits on government capacity forces each entity, industry and regulator to conduct a thorough and painstaking search for an appropriate solution' maintain Price and Verhulst (2005, p13). Their research reveals that citizens believe government agencies are capable of achieving more than actually occurs. This is due to the public's perception of the power of enforcing institutions and in its confidence in the corrective measures produced by the introduction of fresh legislation.

Bardhan (2002, p.185) claims that central governments have lost a great deal of their legitimacy, and decentralization measures are regarded as a remedy to this by reducing the role of the state in general. However, 'viewed

objectively Local Authorities have little influence compared to Central Government' state Blondel and Hall (1967, p.323). The situation appears to have changed little since that date even though there is meant to be an ideological commitment to localism by the present Government, Lowndes and Pratchett (2012) argue that any reform process is far from coherent and is constrained by conflict. The question of the distribution of power and influence between local councils, organisations, and central authority still arises and thereby impacts on the regulatory outcomes of each Building Control body and the local Administrative Authority. The behavioural products of an Administrative Authority are greater if there is a fit between the personal motivation of councillors and the organizational environment according to Pedersen (2013). The influence of political drivers specifically on public sector Building Control management does not seem to have been explored, but Fulup et al. (2002) illuminate some of the similar and potential problems that have occurred in the National Health Service through reorganisation, particularly the negative effects on the delivery of service. No comparative studies have been located concerning private enterprise Building Control and the management or ownership of the various organisations that make up that particular sector.

2.9 Variations in practice

An evaluation of national Building Regulations carried out in Holland demonstrated national uniformity was considerably undermined by divergence in administrative authorities' practices. The way Local Authorities' checked plans and the manner in which site inspections were conducted varied between administrations (Visscher and Meijer, 2009). There were differences in the length of time and number of site inspections that took place and the period it took to check and approve plans. Part of the call for privatisation in England was due to these types of issue influencing the political agenda which wished to roll back the power of the state with promises of improved efficiency. After 40 years of promises regarding the efficacy of private sector working the lack of efficiency gains has led to

reversals (Warner, 2012). Scarce literature has been unearthed regarding how significant are the efficiency discrepancies that might occur between administrative authorities in England. However, Jas and Skelcher (2014) dispute the Dutch conclusions, finding overall that administrative practices varied much less than expected in regulatory regimes in the devolved nations of the UK. Comparing case study practices in the countries that make up the union their investigation contradicted the expected outcome based on previous research. The limited variations in practice they found were due to shared underlying assumptions of the regulators rather than the regulatory regimes themselves. McAdam and O'Neill, (2002) were reluctant to seek direct comparisons but evaluated best value of UK Building Control services through clustered benchmarking and highlighted the limitations they incurred in their research by the use of comparative performance measures in such diverse groupings. Rather than compare an autonomous administration with best practice they adopted this clustering approach as a more beneficial way of measurement. Therefore, reforms that have occurred in English Building Control should perhaps be understood in the wider context of the processes of change, such as compulsory competitive tendering and best value which first started to take place during the 1980s. This new managerialism is generalised by Clarke and Newman (1997) as a public service management and working system that adopts techniques associated with the private sector, profit orientated enterprises.

Governance plays a role in ensuring that regulators take a societal view rather than one of narrow self-interest. Gunningham (1987) highlights areas in how advise and persuade strategies have been used to avoid conflict with powerful regulated industries and avoid political backlash. An optimal mix of persuasion and punishment is the solution to maximum compliance (control of every process) put forward by Braithwaite and Grabosky (1985). Extreme compliance strategies have been justified, for example, in the case of the Mines Inspectorate (Gunningham, 1987), providing support to the notion that each regulatory authority must judge for itself the optimum strategy to adopt. The culture of an organisation influences its effectiveness and performance,

(Gray et al., 2003), small organisations were more performance orientated than medium or large ones. They defined small as less than one hundred employees. Few Building Control departments throughout England have staffing levels of more than thirty, but all local Administrative Authorities employ over one hundred persons. The work of Gray et al. (2003) is particularly relevant due to the research's focus specifically on domestic extensions and Building Control units within larger corporations. Three questions are underlined here. First is the size of the department the material concern, secondly is it the size of the organisation itself, and thirdly is the influence of magnitude two-dimensional, vis-à-vis the size of the regulatee to the scale of the regulator. Interestingly an examination of the strictness of regulatory policy having a reverse effect on the market structure is underlined by Noam (1984). He discovered the strictness of local enforcement statistically correlated with the size of the firm of the regulatees. As the focus of the research will lean towards small contractors because they are usually the type of businesses that undertake domestic extension contracts, there might be an opportunity to test this observation.

2.10 Enforcement

It would seem logical that differing enforcement modes would have a bearing on regulatory compliance results; Hutter (1989) argues that regulatory enforcement styles exert leverage on end results but were not uniform across the UK. Her examination of intra and inter-agency variations is limited to three inspectorates, but she demonstrates that explanations for these variations may be found in the variety of social, organisational and political factors involved. The study highlights differences between Local Authorities but fails to focus sufficiently on the dissimilarities between departments within the same organisation. Unfortunately, no comparative data are provided expressly regarding Building Control units situated within separate Authorities or their own particular enforcement styles. She does not view them in the context of how these organisations conduct or supervise their regulatory functions in specific, unique and distinct

departments under diverse legislation and with conflicting agendas. Prior (2000) in fact demonstrates the similarities that Planning Departments have with each other although located within different Local Authorities, stressing their unique difficulties in enforcing planning legislation compared to other corporate laws and offers remedies through changes in theory and practice. McKay et al. (2003) also provide solutions to the difficulties in enforcement, contributing to the discussion by suggesting not just training for personnel but that new legislative innovation is required. This highlights fundamental departmental differences that occur in Local Authorities because each separate unit works under its own particular legislation which is germane to its rational function. The distinctiveness and peculiarities of the separate sections of each Council as regulator is emphasised by contrast in the diverse and dissimilar character of the regulatees. Fairman and Yap (2004) found that the primary motive to improve food safety came not from within, that is the regulatees, but from the enforcement agency staff which in that study was the Environmental Health Department. They discovered that many small enterprises lacked knowledge and skill regarding food safety and thus relied on the regulator to identify and direct compliance. This middle way approach occurs in other regulatory regimes where one man traders and small companies are not always acquainted or up to date with the legislative requirements.

Research in the USA highlights differences in enforcement styles, in taxation issues short term matters are dealt with in the taxation of employees, long termism in large corporations, and a middle way with small businesses (Dye et al., 1991). In the context of separate departments within English Authorities, for example, Planning units have a long-term approach, as resolving issues take a considerable amount of regulators time and enforcement only occurs after a long series of advanced discussions. Highlighting this long drawn out process McKay et al. (2003) address the problem by considering alternative theoretical perspectives for time-saving improvements. In contrast to the middle way or the long term approaches, the short term method exhibits limited regulatee-regulator interaction. As an

illustration, Car Park Departments issue an enforcement notice (parking ticket) as soon as a contravention is identified. Petiot (2004) advocates an even more rapid and immediate enforcement action by Local Authorities and the elimination of most contact between parties when dealing with parking offences thus emphasising the rapidity of this third way approach. However, it is the United Kingdom Government's policy to encourage compliance without resort to legal proceeding (Communities and Local Government, 2009b). Interestingly, at the Local Authority Building Control Conference in March 2012, only 56% of attendees agreed that the Building Regulations were being enforced (Ambrose, 2012). The conference statistics regarding attendees' organisation of employment were not broken down by size or location so they cannot be further analysed or compared. Nonetheless, the results do provide an indication regarding the perception of Building Regulation compliance and enforcement action by the regulators themselves.

2.11 Building Regulations Application procedures

Besides the composition of the controlling bodies, the primary legislation and related factors encompassed within the theme of governance one further area of inquiry is the leverage affect on regulatory outcomes through the actual application procedures for obtaining Building Control permissions. There are two methods of making an application in England for Building Regulations purposes; an applicant may make a request for Full Plans approval or submit a Building Notice. The adoption of the Building Notice scheme (Building Act 1984) to cover the entire country expanded the procedure previously used only in the old London County Council area (London Building Act 1930). Building Notice applications were designed for use in small works and the scheme only applies to the construction of domestic properties. Many domestic extensions are controlled under this procedure, whereby drawings do not have to be submitted or checked by the regulator. It was initiated to speed up and produce a more responsive Building Control process and thus reduce delays permitting regulatees to

commence quickly with building work, subject to giving the Building Control body forty-eight hours notice of intention to start. This was viewed as a means of reducing bureaucracy and red tape. However, Brynard (1995) contests this notion and believes it is a problem of individual perception because under the Full Plans approval scheme, works can legally commence before drawings are approved, providing the work conforms to the building codes. Rather he maintains it is a system that reduces cost because it curtails the Designers' role to only producing Planning drawings thus omitting specifications and Building Regulations details or eliminates the Design function altogether.

Besides the contention concerning bureaucracy and efficiency savings, it is still purposeful to investigate if the differences between Full Plans and Building Notice applications actually influence Building Control resource use. The results of a survey of problems concerning Building Notices (Communities and Local Government, 2008b, p.17) classified Builders lack of knowledge as 19% of the cause of contravention problems and 5% due to lack of appreciation of the complexity of the regulations. Building Control Surveyors also spent 8% of their time giving advice on these problems and an additional 11% on contravention inspections. In contrast, the survey found the time spent for extra inspections was reduced by 28% for Full Plans applications. However, office resources should be factored into the equation because of the requirement to check submitted plans under this route. The conclusion of the survey suggests Building Notices are not being used in the manner they were intended, 'they are being used where ignorance of the requirements are high.' The survey also collated evidence to show that the length of site inspections increase by 20% on work that was supervised under the Building Notice route.

In the paper of McAdam and O'Neill, (2002) specific application assessment response times for both Full Plans and Building Notices by Local Authority Building Control bodies were analysed. Direct comparisons between the two types of application could not be established due to the lack of provision of

levels of service indicators for site inspections for each category. That there is a problem with the Building Notice scheme, which probably influences economic resource allocations, was reinforced in the Building Regulations report (Communities and Local Government, 2008a). The responses by Building Control, professional, and trade associations was overwhelmingly positive to the suggestion of limiting the scope of projects that could be covered under this scheme. The report was a nationwide enterprise but relied entirely on voluntary replies to questionnaires. There were thirteen set questions posted or e-mailed to various bodies and persons. It consisted entirely of analysis of the data obtained from one hundred and thirty-seven entities who responded to the questionnaires regarding the Building Control system in England and which covered all categories and size of construction projects. The majority of the replies were from Local Authority Building Control the sixty-one remaining respondents came from nine other groups, of these Home Owners only numbered two, Builders two, and Designers five. Six other categories made up the remaining fifty-two responses. These consisted of Manufacturers, Property Developers, Approved Inspectors, Specific Interests, Energy Sector, and others. This survey was not methodologically vigorous and primarily tends to reflect the views of the regulators. Further research and reports are to be undertaken by BRAC in the future (Communities and Local Government, 2012b) concerning further inquiry to the Building Control function.

2.12 Conclusion Governance

There is sufficient writing to give a proper historical background to Building Control and an overview of its present regulatory functions. There has been international research germane to a variety of administrative authorities and the role of governance in advanced capitalist states. There has been a global shift to roll back the power of the state leading to privatisation and decentralisation, with many centralised actions being devolved to local or private sector organisations. Competition has compelled Authorities to review, amend, alter their attitudes, and practices thus influencing and

impacting on the market and the regulatees. No academic research or study has yet been identified concerning differences in outcomes specifically between private and public Building Control bodies.

The widespread adoption of performance regulations to replace prescriptive ones has been researched in many countries. Criticisms of complexity and partial return to the traditional measures have been voiced, but little action has been taken to return to previous methods. Alternative regulatory systems have been adopted in other industries but have not been found appropriate in construction. Self-regulation as a means of regulatory control has moved forward overseas faster than in England. The Government's intention is to proceed along this route but views the scheme as requiring more robust monitoring and enforcement procedures.

Little research has been undertaken to compare Full Plans and Building Notice procedures, what literature there is reveals major concerns within the inspectorate and some sensitivity within the industry of how Building Notices are being used. The intention of Government to make regulatory compliance procedures for minor works quicker and easier will be welcomed as the present Building Notice scheme has been shown to be a source of vexation to the regulator. There appears to be agreement that some works are too large or complex to be truly categorised as minor and that some Builders are not acutely aware of the requirements of the Building Regulations. The literature on this topic revealed questionnaire survey evidence only from the inspectorate and none from regulatees, no empirical evidence came to light specifically concerning differences between the two application types.

2.13 Social

The literature has been reviewed regarding this second theme looking both at actors as regulatees and regulators. Information has been sought not only within the construction field but in other industrial and commercial domains as well. It draws on several sociological studies into human reactions by

regulatees to regulatory control whereby they strive to achieve conformity and compliance. In addition, it focuses on the reverse side of the mechanisms encompassed by the ordinances of regulation and their application by considering the actions, attitudes, and difficulties encountered by the regulators. As Cooke and Williams (2009) reason, successful projects cannot happen in a vacuum and all the actors involved in them have a direct and indirect influence on outcomes.

2.14 Home Owners

Hand et al. (2007) points out many Home Owners have responded to spatial pressures by extending or reformulating their domestic space. 'Conceptually it was assumed that householders make a voluntary decision to move when their current residence no longer meets their needs' claim Baum and Hassam (1999, p.32). Residential dissatisfaction by Home Owners with their present homes did not necessarily lead to purchasing new properties. The results of their finding did not address alternative actions such as Home Owners who buy properties with the intention of extending them. Munro and Leather (2000) argue that when expanding or enlarging a house, consumption motivated expenditure is often prioritised over investment works. The motives by which Home Owners are induced to expand their living spaces may reflect not only proposed domestic extensions' outcomes, but be an influencing factor in their attitude to the regulator. This nest building approach contrasts to investment repair works which focus on a consumption induced disposition seeking rapid action and a quick return on expenditure. Home Owners perceptions of their station within and their attitudes towards society are often founded on their position actual or perceived as Home Owners. In the view of Gurney (1999), the growth of home ownership has been so widespread over the previous generation that it has become normalised. Weberian or Marxist economic conceptions of power he argues are no longer applicable. Home Owners' societal view has changed and a transformation in the leverage they exert on the regulators and other actors engaged in the construction of their domestic extensions reflect this attitude. Jones et al. (2007) have found there are more negative

risks to Home Ownership than there used to be, but householders still tended to have a strong belief in home ownership and were not inclined to perceive the negative issues they might encounter. Individuals dismiss concerns of higher interest rates and job insecurities as they concentrate on more positive actions such as extending their properties.

Cooper (2013) thinks the general public have too high an expectation of the Building Regulations. Home Owners are inclined to believe they offer total protection and 100% performance of the building, whereas they are a third party mechanism. A general perception amongst lay members of the public is their poor image of Builders who they blame for many construction problems. This simplistic view is often based on media horror stories but is corroborated by construction directors who have been shown to hold comparable views (Proverbs et al. 2000). Even so it has to be admitted the minor works sector of the building industry has a poor reputation and this acts as a discouragement to many Home Owners (Leather and Rolfe, 1997). They argue this situation becomes worse during a recession and that measures should be introduced to educate consumers better. Some researchers view Home Owners as defenceless actors susceptible to rogue contractors and overzealous officials; Morgan (2009) draws attention to the vulnerability of Home Owners who run into financial difficulties. However, the proportion of the Home owning population this sector might represent is hard to determine from the paper. It might be argued that Home Owners who require additional living space may be reluctant to increase their expenditure on building an extension if they are in financial difficulties and possibly have to sell or foreclose on their mortgages. The investigation lacks some causality and as Cannon (1994, p.307) attests 'those who aim for a comprehensive body of statistics and who have an interest in this should ensure that the data correctly reflects their expectations and requirements.' The case study undertaken by Rukwaro (2009) sheds light on interesting and rich data. He seeks to find reasons for violations of the building codes and if Home Owners play a role in their causation. Interestingly he sees a role for Home Owners to have input into the drafting of new Building

Regulations. The management and skill knowledge of Home Owners is revealed as a factor in the standard of work encountered within their own dwellings (Kangwa and Olubodun, 2003). Home Owners understanding of the regulatory processes may also influence outcomes, May (2004) argues that compliance is not just achieved by enforcement and deterrence but also from a sense of obligation and shared commitments for fulfilling an implicit regulatory social contract. The downside as Haines (1997) suggests is that once inspectors have to get tough to achieve compliance, any future facilitative approach with regulatees will backfire, no matter their previous benevolence. Winter and May (2001) emphasise that knowing the rules plays a critical role, maintaining that normative as well as social motivations are as influential as calculated motivations. They found Home Owners with a high awareness of the regulations had a greater feeling of moral obligation to obey them. This reinforced their earlier findings concerning compliance regarding regulators and regulatees (May and Winter, 1999) inclining to a more nuanced view concerning cooperating with regulatees. Granmann et al. (1995) proved by laboratory experimentation that greater awareness of the codes and consequences of possible sanctions increased compliance even amongst actors with low social responsibility traits.

2.15 Designers

It has been claimed there should be an increase of work for Chartered Architects due to a surge in planning applications for home extension (Anon, 2011b). Fees for Architects range from 8-15% of the cost of the works (Borson, 2013) this may represent a substantial amount of a budget for a small extension especially after Building Control, Planning fees, and VAT have been taken into account. From personal observation in practice, most Designers submitting applications for extensions are not Chartered Architects and are not qualified to this level of expertise. There is no requirement under Building Regulation legislation (Building Act 1984) for Designers submitting applications and drawings to be registered. Hymer (2002) found that there were various levels of membership of a variety of

different disciplines and bodies that Designers belonged to besides the Royal Institute of British Architects (RIBA). Though there are forty-four thousand members of the RIBA it does not seem that domestic extensions are a field they have captured in a comprehensive way (Anon 2011a). This architectural claim based on the results of a future trends survey appears to provide economic rather than any professional reasons for this situation. If the assumption is correct that most Designers undertaking domestic extension work are not RIBA members, then it is reasonable to suggest that a moderate proportion are members of the Chartered Institute of Architectural Technologists who claim a membership of nine and a half thousand (CIAT, 2013). Their sphere is building science and they specialise more in small projects but do not undertake supervision of construction works. In addition Chartered Surveyors (members of RICS) also often specialise in these types of projects. The changing status of the design profession is highlighted by Foyle (2006, p.41) who refers to the protected status of the Architect and frets at the flexibility of other professional Designers' titles. The pressures to reduce costs are ever present, and the globalisation of architectural services which can be outsourced to developing countries is underlined by Tombesi et al. (2003). The amalgamation of these factors found within the literature would suggest that competition for design work is intense, and indicates that fee reductions occur in practices under pressure to seek new commissions. However, no research has been located that establishes the proportion of Designers of domestic extensions who are unqualified, who are Architects, or chartered and whether this influences resulting outcomes.

There is no legal requirement in England for Designers to be qualified (Building Act, 1984) and therefore, any person may submit plans for Building Regulation purposes. Research undertaken by Pedro et al. (2009) established that this is a fundamentally different approach to most other European countries which only accept plans from qualified Designers and makes the task of checking drawings less onerous. In Canada, qualified Designers have further responsibilities and are permitted to operate as

certified professionals. Meacham et al. (2005) found their role within the project management team being personally responsible for regulatory conformity obviated or reduced the task of Building Control Surveyors in Vancouver. A fundamental change in the regulatory approach would have to take place in England if Designers with recognised qualifications were the only persons permitted to submit Building Regulations applications. Presuming this measure was introduced through some form of self-certification in England, there could be opposition from unqualified Designers who might be excluded from operating. Guckert and King (2002) bring attention to the errors and omissions by Architects in numerous contracts and the liabilities incurred by owners and query who pays for these mistakes. They question the value of Architects, and highlight accusations of Architects living in ivory towers, especially in the light of new information technologies. Akintoye and Fitzgerald (2000) reflect that errors in the contract documents led to problems on site because of Designers' lack of expertise in construction processes. Hofstadter (2005) challenges these charges demonstrating the value good Architects can bring, drawing on their foundations of knowledge and know-how.

It has been argued that the burden of compliance with the regulations is becoming disproportionate to the perceived benefits and Designers and others involved in the construction processes are finding it difficult to keep up to date. Also, enforcement has been erratic and inconsistent (Achieving Building Standards, 2007). This report suggests that simple prescriptive guidance should be available to Designers of smaller projects and simpler buildings. This would permit practices without extensive technical libraries and comprehensive personal expertise to produce more user-friendly drawings and specifications which conform to the building codes without amendments being required by Building Control. Piecemeal ways of reviewing the regulations have added to the difficulties Designers have in endeavouring to keep abreast of regulatory changes (Communities and Local Government, 2008a).

Experience, qualifications, and competition for work are elements that affect the cost of employing a Designer. The requirement in other countries to engage only qualified Designers and who in some cases are permitted to verify their own work would be influential factors in resource use if legislative changes were made to the English Building Regulations. Nonetheless, there are forms of Design adaptation that do not include these concepts an example being the notion of participation. 'Participatory measures' may be formed through interactions with clients, Planning Authorities, citizens working collectively, or individually as Home Owners. Participatory design processes are being applied in planning and urban design (Sanoff, 2008) and can enhance the sense of community in a given district. Nonetheless, there appears to be an absence of reference to the importance accommodating Building Regulations in this approach. It may well be Designers emphasise those participatory aspects of design just described but fail to prioritise other important features in the process which in turn may impact on regulatory outcomes and project costings.

2.16 Builders

Holt and Edwards (2005) found that Builders are often labeled in a derogatory manner but the evidence they are the primary cause of non-compliance in domestic extensions and by association the reason of for additional economic resource use by the inspectorate is unsubstantiated. Empirical evidence is required to verify these assertions and to determine how widespread they are, at present there is little indication except for media coverage of construction misfortunes. Dainty et al. (2005, p.389) confirm there is a paucity of research into the highly complex construction labour market. Their work highlights that poor expertise is the major factor in the workforce for poor standards rather than the shortage of new entrants. According to Cooke and Williams (2009), much of the workforce is itinerant and has a low level of education with few criteria to limit entry. The qualifications and experience of site managers vary considerably according to the research of Baiche et al. (2006). Schaafama (1997) acknowledges

there is a problem in delivering a practical means of training that attracts small builders. He notes that training expenditure in management and supervision skills in the construction industry is well below that in other industries. The current construction labour market rests on casual self-employment, rigid trade divisions, and output based pay Clarke (2006, p. 255). The research also compared the skills level in the U.K. with other European countries and found that in Britain 'labour is not valued according to the knowledge it incorporates.' and contrasts the sharp divide between operative and professional/technical skills. She states Labour is not rewarded for its potential but for its product. The duties placed on contractors of planning, monitoring, and managing a construction project together with consultation with the work force improves helps to improve the current labour situation (CDM 2015). Nonetheless, on larger projects there is still a greater degree of professional control in contrast to minor works which operate with higher levels of labour domination.

Consumer durables and retail goods are usually free of defects at the point of purchase as such items are manufactured and replicated in controlled environmental conditions and produced in a considerable volume of units. In contrast works such as buildings, civil engineering or shipping, which are primarily manufactured on site, the resulting outcomes are not necessarily so predictable or the standard of quality so consistent. The construction industry is vast and complex and though large companies make up the bulk of the turnover Cooke and Williams (2009) maintain most businesses are small with 93% employing less than fourteen people. Somerville and McCosh (2006) found new domestic construction undertakings have numerous defects before and after completion of works but from their random inspections they discovered variation between the size of contractors and the square meterage of the property in these shortcomings. A significant improvement in quality is required to reduce the number of faults that occurred. The responsibility for corrective measures is laid at the feet of the contractors who absorb the costs of remedial work and customers' dissatisfaction. The research did not investigate the influence

that defective work had in achieving compliance with the building codes or the impact on the inspectorates' resource use. Nonetheless, the totality of construction defects in any given number of projects must, at least, impact to some degree on the regulatory system overall. The study by Somerville and Gosh, (2006) confirmed the findings of Soetanto et al. (2001) which similarly indicated the need for contractors to improve in most aspects of performance. Koehn and Caplan (1987) conclusions concur with these findings reflecting that though there are differences between contractors size, the potential for improvement is approximately equal. The twenty-year time frame over which these studies took place has been sufficient to identify the seriousness of the problem. Unfortunately, the evidence does not indicate any improvement in the situation even amongst firms of differing size. The question ought to be put, if researchers are identifying consistent quandaries over significant time spans, as the literature reveals, and remedies are suggested then why are there such low levels of application? Either, researchers are not offering practical explications, contractors are not implementing recommendations, or there is some type of deficiency in communication and interaction between academia and industry.

The majority of contractors constructing domestic extensions are small companies the remainder are medium sized ones and no major or volume contractors operate in this field (Ball, 2014). Mistakes in construction work are routine asserts Riemer (1976) writing nearly forty years ago and who claims they are not an inevitable part of the process. His work is reinforced by subsequent research but not regarding the significance of the predestination of construction mistakes. Importantly he identified three areas from which these consequential errors stem and which could be corrected because they are manageable and predictable. He recognised the transitional nature of the work, the diverse multi-skilled specialists, and the negotiated process by which the work gets done. These are territories where potential improvements could be made, but he still has misgivings that in themselves they would ever achieve the complete elimination of all problems.

Builders may unwittingly be rebuked by clients for construction mistakes through no fault of their own because they are often the only actors on site and easily contactable. Third party professionals have been criticised for inaccuracies that occurred because estimators lacked the practical knowledge of construction processes, and for which Builders often received the blame (Akintoye and Fitzgerald, 2000). Additional links in the information chain is a further example of an influence on poor outcomes for which Builders sometimes stand accused. Subcontractors constrain the communication of regulatory expectations because the inspectorate does not always deal with the main contractor who may be off site (Mayhew and Quinlan, 1997). By conversing with the sub-contractor, who may not necessarily have a broad overview or knowledge of the project, not all relevant intelligence is communicated to the Building Control Officer.

In some countries, only qualified Builders are permitted to undertake construction work (Van der Heijden, 2006). No literature was discovered concerning the effects on compliance abroad concerning the exclusive use of qualified contractors in comparison with unqualified ones. In England qualified Builders appear to be a diminishing breed, labour sources from the European Union have increased at the same time apprenticeship rates have fallen, and the cash in hand economy has grown. The building trades are standing at a crossroads in the twenty-first century is the view of Erlich and Grabelsky (2005, pp.424-426). They maintain that trade unions which have lost so many members over the past thirty years should reassert their presence and power and help re-establish uniform standards and a level playing field. In comparison Slaughter (1993) provides reasons for optimism because Builders can be sources of innovation. Rather than contractors being viewed as conservative and unchanging in their ways, he produces evidence that as users of new building technologies they can be important sources of originality and improvements, 'the design of products can explicitly accommodate the need for changes and innovations on-site'. Hardie and Manley (2008) strengthen these assertions and praise small

contractors by complimenting their inherent flexibility. However, criticism of the operation of Builders and their operatives continues, Vee and Skitmore (2003) discovered instances of negligence, unethical conduct, and fraud amongst actors engaged in the construction industry in mitigation they did report that 90% of respondents subscribed to a professional code of ethics. This could be classed as good intentions rather than affirmative action.

A number of academic studies have endeavoured to address the reasons for some of the poor reputation and image of the construction industry. For example, the high attrition rates of the workforce, its male gender orientation, fragmentation, and seasonal variability. Eccles (1981) foresaw that subcontracting would have major implications for the nature of the construction industry. The transient nature of subcontracting means trade operatives lack commitment and loyalty to the principal contracting company; the avenue for apprenticeships is diminished, and quality control over the workforce decreases. These factors can be of particular relevance in domestic extension works. Webster et al. (2001) comprehensively established that there were high levels of unqualified people working as tradespeople. They found this situation was not due to lack of trained workers but due to economic reasons; employers upgrade non-trade workers to undertake skilled jobs. Those findings are disputed by Karmel and Ong (2009) who judge there is a current skill shortage and that as new entrants to the workforce are a specific demographic group, which is young men; construction is particularly vulnerable to an ageing population. However, Turner et al. (2015) found that young people view construction sceptically, being adverse to a career in the industry seemingly discouraged given its negative reputation through reports in the media. These suppositions are reinforced by other researchers (e.g. Proverbs et al., 2005 and Holt and Edwards, 2000).

Operatives in some areas can self-certificate their work if they believe it complies with Building Regulations. This relieves Building Control of some regulatory activity whilst placing responsibility for certain functions onto

Builders. In generating ideas to make compliance less burdensome for Builders a Government report (Communities and Local Government, 2008a), suggests extending the use of this 'competent persons scheme.' 22 competent persons schemes are in operation at present (Communities and Local Government, 2013). However, Shahriyer et al. (2009) discovered there was little active checking on installers by scheme operators and call into question the overall competence of the operatives involved and if regulatory requirements are being met. Another evaluation of the schemes stated that higher levels of quality assurance are required (Communities and Local Government, 2009c). Due to the widespread dissatisfaction with complex codes and red tape, a campaign was organised to reform the regulations and increase the role of competent persons and self-certification (Lane, 2006). Even with the reservations regarding quality control, the Government, after consultation with the industry, is taking forward self-certification schemes and from their documentation there appears to be a general agreement this is the direction to proceed (Communities and Government, 1998). Further consultation procedures commenced in 2010 and an impact assessment whose objectives were to ensure cost effectiveness, efficiency, and compliance was published the following year (Communities and Local Government, 2011). Nonetheless, the serious question of checking the competency of the actors involved in this scheme remains unanswered. For sure this function will stay with Builders own associations and federations rather than with Building Control bodies.

A study of quality in the construction industry by Seymour and Rooke (1995) concluded that the then-current rationalist paradigm, whereby actors believe decisions are based on deductive approaches, endorses existing attitudes and so researchers have a role in changing the culture of the industry. From the literature, the fact remains, little empirical research has been produced in this field on which firm recommendations for change and improvement can be based.

2.17 Regulators

The unreasonable attitude of the inspectorate in the past led to suspicion of government power by regulatees and has been recognised by Bardach and Hagan (1982). They concur with other authors by demonstrating that the most successful way of achieving regulatory conformity is through discretion and professionalism. May and Wood (2003) failed to find any direct influence in differing enforcement styles on compliance. They found street-level bureaucrats (Building Control Officers?) approaches influenced the knowledge of regulatees understanding of the rules, cooperation with inspectors and shared expectations were the most satisfactory ways to achieve desired results. “Gone are the days when the Building control practitioner considered him or herself the construction industry’s very own version of God with his or her very own set of commands” enunciate Wood and McGahey (1995, p. 21). The statement reflects the shift in the attitude of Building Control Officers over the preceding ten years subsequent to the changes in Building Control systems in 1985 (Building Act 1984). Did the pressure to cut costs and maintain service levels which Wood and McGahey (1995) mention together with the change in practitioner attitudes influence economic resource use? Their research does not cover this topic but they did find there was an increase in professionalism and qualifications expected of Building Control Officers. Interviews with Building Control service users undertaken by Barr and Hammond (2012) revealed over 80% of respondents were satisfied and reassured by Building Control personnel. However, the survey included both private and public Building Control and did not break down the data into segmental construction categories; therefore, there were no means of discovering the opinions of end users specifically regarding domestic extensions. Looking at the domestic construction sector rather than the whole industry, Baker, (2013, pp.10-11) found “House builders’ relationship with Building Control is remarkable compared with other industries and their governing bodies” The indications are that Building Control Officers are perceived to be doing something well. Scott (2012) considers there should be more links between Building Control

and developers calling for assistance from the inspectorate to support the depressed building industry by being more willing and open.

John Gummer (2006, p.37) criticised Building Control staff in England for having no formal training. Research into Building Control Surveyors qualifications in New Zealand revealed, that failure to invest in resources to train inspectors led to regulatory regime failure is also a view supported by Hunn (2002). Personnel employed in Building Control are fully trained professionals and membership of the Royal Institution of Chartered Surveyors, or the Chartered Association of Building Engineers is usually a condition of employment (LABC, 2014c). Amongst suggestions put by Barr and Hammond (2012) who researched Building Control training programmes were that inexperienced surveyors should be at all times accompanied by an experienced colleague until they were fully qualified, commenting how committed management was to ensure the quality of the skills base of the inspectorate. Gummer (2006, p.37) claimed a very high proportion of buildings do not conform to the regulations and that there was no easy appeal from the charges Building Control levy. Pan and Garmston (2012, p.599-600) agreed in part, specifically concerning energy efficiency regulations 'it is a serious concern when Building Control approves so many dwellings when insufficient evidence of compliance has been received.' An investigation conducted by the Building Research Establishment confirmed this assertion, and found levels of compliance were not always sufficient (Baiche et al., 2006). The chairman of the Building Regulations Advisory Panel is less critical of the regulators contending that 'overall the Central Government is content that Building Control works well' states Ambrose (2013 pp.12-13). Regulatory services can always find room for betterment; ways of improving the service are suggested by Levin (2009) who sees the Swedish model as the direction to travel. Through building on the regulators' existing healthy relationships, concentrating on higher degrees of openness, accountability, and autonomy for the inspectorate. Challenging this optimistic view, predictions of future regulatory control changes that could herald the undermining or dismantling of Building Control services have

been posited. Hawkesworth and Imrie (2009, p.552) suggest 'Partnerships and networks are part of a complexity of regulation, in which outcomes are not the products of any one professional or actor, but part of a diversity of overlapping relations and interventions.' Implying externalities and events could overtake regulators engrossed in their versions of the reality of regulatory action.

2.18 Conclusion Social

The literature reveals various rationales for Home Owners' to extend their houses which fall into two broad categories, either enlarging to meet spatial needs or to advance opportunistic value to the property and sometimes a mixture of both. Sociological influences through changes in home ownership within society combined with Home Owners own attitudes influence construction and regulatory results. Naïve assumptions about the effectiveness of the inspectorate and the incapableness of the contractors can also colour Home Owners perceptions about the whole domestic extension construction process. Home Owners who possess high regulatory awareness are more likely to ensure they abide by the codes and feel a moral responsibility to comply. As might be expected Home Owners with a strong awareness of construction processes were also more likely to conform.

Qualifications and experience of Designers seem to vary. In advanced capitalist countries Designers with the appropriate qualifications often certify their own work something not permissible in England. Competition between Designers is increasing, and the status of the profession is altering due to new technologies and changes in social attitudes. There have been calls internationally for Designers to have a more participatory role in shaping future regulations.

Builders have had a poor press and research has highlighted unethical conduct and shortcomings in workmanship and a need to improve

performance. Some research found there was innovation by Builders, but overall skill levels were low in comparison with Europe and there have been problems in delivering practical training. Inquiry into Builders' qualifications demonstrated that there was a lack of suitably qualified operatives with the correct levels of skill. Self-certification has taken place to a limited extent, but there are concerns that the checking mechanisms to ensure conformity have not been robust and the scheme has not gone forward as fast as the Government would wish.

Minimal research has emerged concerning the specific opinions and views of Building Control Officers. The literature indicates that differing enforcement styles have little bearing on outcomes, whilst the qualifications and expertise of the regulators are crucial factors in ensuring conformity. Building Control Surveyors have been operating in the private sector for three decades; their advent has influenced those in the public sector resulting in a more competitive and professional outlook.

2.19 Technical Complications

A nationwide survey in the United States of America investigated the causes of delay in the construction industry (Baldwin et al., 1971). It was found that seventeen separate categories each affected construction progress. These items have a detrimental influence on outcomes, but the extent to which specifically non-social influences occur were limited to two. These were concealed underground conditions which affect drainage and foundations, (both of which require statutory inspections by the regulator) and concealed elements within the structure which may or may not. It was acknowledged that some hidden constituents will remain undiscovered until uncovered as construction proceeds even though ways were suggested in the paper to overcome delays for all other types of categories. Not all problems that occur on site in domestic extension projects are related to programmed statutory inspections. Regulatory non-compliance aspects of the construction and associated problems may come to the attention of the

regulator on other occasions. Most of these problems have a social dimension rather than a physical cause as Odeh and Battaineh (2002) point out 'owner interference, inadequate contractor experience, financing, labour productivity slow decision-making, and insufficient planning are amongst the top ten most important (social) factors' that result in problems that produce delays which can lead to extra regulatory resource use. Al-Momani (2000) concurs with these previous research findings regarding late deliveries as another cause of on-site problems, again usually of human-related causation. Similarly, a study of defects by Josephson and Hammarlund (1999) demonstrated the majority of defect cases where anthropoidal in root, but noted that material failures resulting in non-compliance were also issues to consider.

The fact that Substandard materials have caused construction problems a fact that has been known for a long while and that these defects do not always come to light for some time. An example is the scientific introduction of calcium chloride into concrete under controlled laboratory conditions to induce rapid curing times which later caused problems when the detrimental reaction was discovered on site (Ball, 1988). Other failures have occurred with different materials in various countries for example research in Saudi Arabia by Assaf and Al-Hejji (2006, p.47) revealed damaged or substandard materials were a cause of delay in a number of cases albeit their findings focused on large projects. In the UK and Yates and Lockley (2002, p.16) have provided a lead in developing, analysing, and documenting these shortcomings. They offer proposals and recommendation for the reporting of the findings of any future failures and if adopted this could go some way in bringing attention to professionals in the industry of these types of risks.

To obtain Building Regulations approval, specifications and drawings must state that materials conform to the relevant benchmarks, British Standards, European Norms, and so forth. However, some imported goods may inadvertently be used unknowingly as highlighted by the TUC in their report about substandard safety equipment (TUC, 2013). The use of recycled

materials is increasing, primarily because the construction industry generates a substantial proportion of waste to landfill with concurrent charges and also due to the influence of sustainability regulations. According to Oydele et al. (2014, p.30), clients have negative perceptions of their use but they advocate there should be an encouragement to take more advantage of these products suggesting tax breaks and government legislation as a means of increasing consumption. There are disadvantages to the regulator as often there is no record of quality control, and there can be considerable variations in recycled products standards (Berg, 2009). Similar problems have been found in cob buildings. Straw, water, and subsoil are its basic ingredients, but it is problematic for the inspectorate to comprehend every variation in the characteristics of natural fibres, the geological conditions of the subsoil, or the geographical location of its origin (DEBA, 2008).

Reimer (1976) acknowledges that new works are permeated with future hidden problems so it is reasonable to suggest similar problems will occur in older properties that are being altered for the construction of an extension. There is a scarcity of written work on this subject but actors concentrating on their own tasks fail to foretell of future difficulties until they are encountered is a view supported by Carmona (2009).

2.20 Conclusion Technical complications

Defects and delays occur quite regularly on site, and the literature is quite consistent in identifying the agents and causes as well as providing explanations and remedies. Nearly all the reasons for these failures are through social actions; few authors have identified actual material failures, or concealed conditions as grounds for major delays and defects, but some of them have come across these factors during their research. It appears these types of technical problems are not extremely common and because there are no social explanations for their occurrence they tend to be just accepted much akin to natural disasters. No evidence in the literature could be found

that any of these technical complications eventually resulted in non-compliance with the Building Regulations or were a cause of an over-run of resource use for the regulators.

2.21 Overall Conclusion

A considerable amount of research has been undertaken in the field of regulatory control and governance, and there are some rich findings in the literature. Performance regulations and private sector Building Control in all advanced capitalist countries seem here to stay. The literature was almost devoid of research concerning non-conformity of completed construction works as opposed to research into construction delays and general defects. It should be noted that many aspects of workmanship, materials used, and construction methods though they might be written into contract documents and specifications are not necessarily controllable under Building Regulations legislation. The literature demonstrates that there is a general dissatisfaction regarding the use of Building Notices. Further inquiry is required into both Full Plans and Building Notice applications to verify the Building Control resource use and end outcomes of projects that have been administered under these two different schemes.

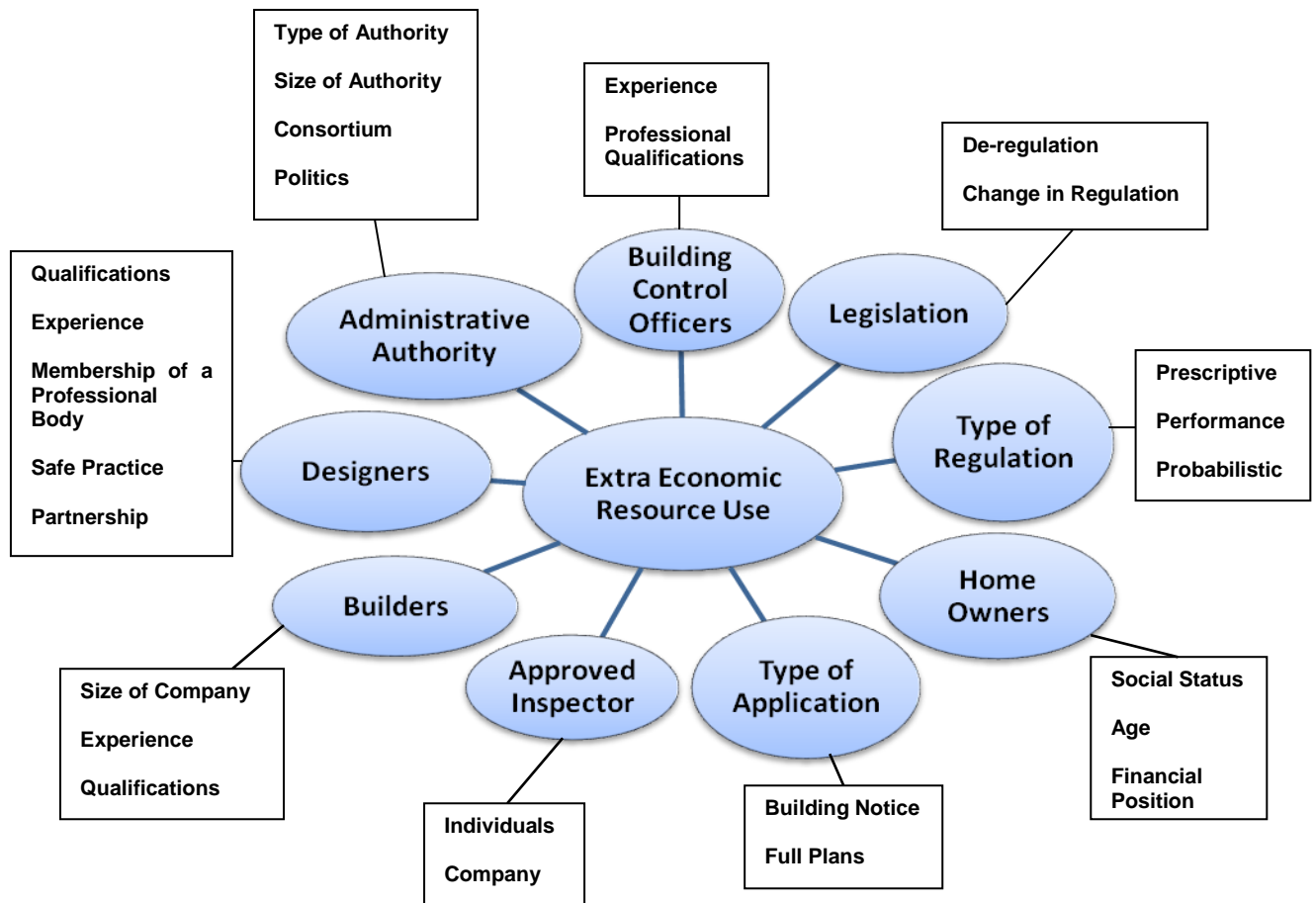
The human influence on outcomes has been shown to be the most dominant aspect of all of the three themes explored. However, the literature is not overflowing in specific comparisons with individual actor categories, especially concerning construction projects. Suffice to say there is sufficient information to provide guidance into the direction that exploration should proceed. Concerning technical complications it has been difficult to separate out the formidable dilemmas that occur on site regarding all areas that go amiss, a number of possible subjects to concentrate on in the research have materialised.

No writings were discovered that focused on the question why achieving compliance in domestic extensions comparatively uses more economic

resources than in other types of projects. In some ways this is an exciting result as the research will be covering uncharted terrain. The research programme has emerged more focused through the use of the current literature which has helped provide a foundation for sign posting the direction of inquiry. However, the literature is more constructive when combined with one's own experience, in developing concepts that can be validated against actual data (Strauss and Corbin, 1990).

3.0 RESEARCH METHODOLOGY

Figure 4: Possible influences on extra economic resource.



Methodology takes a considerable time in research as the researcher attempts to place his/her works amongst the existing works on the topic, drawing on the insights from wide range literature reviews, and developing an innovative angle on the topic, Sutrisna (2012). Methodology is driven by certain ontological and epistemological assumptions.

3.1 Research Ontology and Epistemology

Ontology concerns the nature and conception of reality and logically precedes epistemology a view endorsed by Sutrisna (2012). The way we view the world and what we believe constitutes social reality is an ontological position (e.g. Fox et al.; 2007, Blaikie, 2000). The researcher's ontological stand, at an earlier career stage, reflected the accepted perspectives of associates in practice that social meaning and phenomena exist independently of social actors. This description seems appropriate because it accords with the researcher's own technical and later professional background through training in the construction industry which can be philosophically classified as objectivism (Panas and Pantouvakis, 2010). Over the years, the researcher as a Building Surveyor observed how different colleagues learnt to action problems encountered in the construction field through an objective understanding. Subjects and details were frequently viewed in a forthright manner as either being right or wrong. People, who work together in the same industry tend to draw from similar world views and use similar terminology (Grix, 2004). However, promotion into more managerial appointments and a move from the private to the public sector has led to a widening of experience and horizons and a shift in personal ontological view. Many years of part-time study and engagement in academic deliberation have compounded this individual passage of rationale towards a more constructivist position.

Epistemological considerations depend on beliefs about the nature of knowledge (Holloway, 1997, p.54). The Built Environment is a scientific discipline (Grix, 2004), and the author influenced by colleagues and the construction environment held a similar outlook with an epistemological perspective defined as positivism. This is a view based on a positive ontological position, which remains paramount within the industry, a paradigm that champions natural science methods in the study of reality. An alternative ontology that contests that positivist and constructivist ontologies are thought to be irreconcilable has been proposed Cupchik (2001).

However, as the researcher's ontological stance has altered over time so has the epistemological standpoint changed. The reasoning behind this repositioning may be demonstrated by a simple example concerning the calculations required for designing elements of structure. The rationale behind gauging and calculating elements such as live loadings and material consistency seem objective at first glance but are in reality quite subjective. This is primarily due to assumptions being made regarding the constancy of uniformity in the quality of material, the probabilities of external factors such as wind and snow loadings arising simultaneously, preconceptions of buildability, and the assumed intensity of a possible conflagration together with the fire resistance of the element. The literature itself mirrors this graduated shift as suggested by Biglan's disciplinary model (figure 5) described in Chynoweth (2008, p. 35). The work by Baiche et al. (2006) or reports by Government agencies fall on the applied science side of this model. When the technological and economic issues are set aside, and the literature is reviewed in terms of management, social setting, and politics, then there is a migration to the softer end of the scale and sometimes to purer and less applied research. From the literature review, the works of Gaskell (1983) and Ley (2000) are set firmly in the Arts and Humanities, but the preponderance of their research is related to investigation and exploration into regulatory aspects of Building Control. Van der Heijden (2009b) typifies the location of the bulk of the writing explored, securely in the social and creative profession away from the applied sciences. As Rorty (1983) advocates because all perspectives are mediated by culture and language there is no impartial or neutral standpoint. The factors mentioned above and a widening of personal experience have contributed to a shift from previous deductive assumptions towards a more inductive approach. This personal and individual movement away from the dominant scientific disciplines of the Built Environment according to Chynoweth (2008, p.36) has helped channel practical exploration into the actual epistemological considerations that influence and access the acquisition of knowledge.

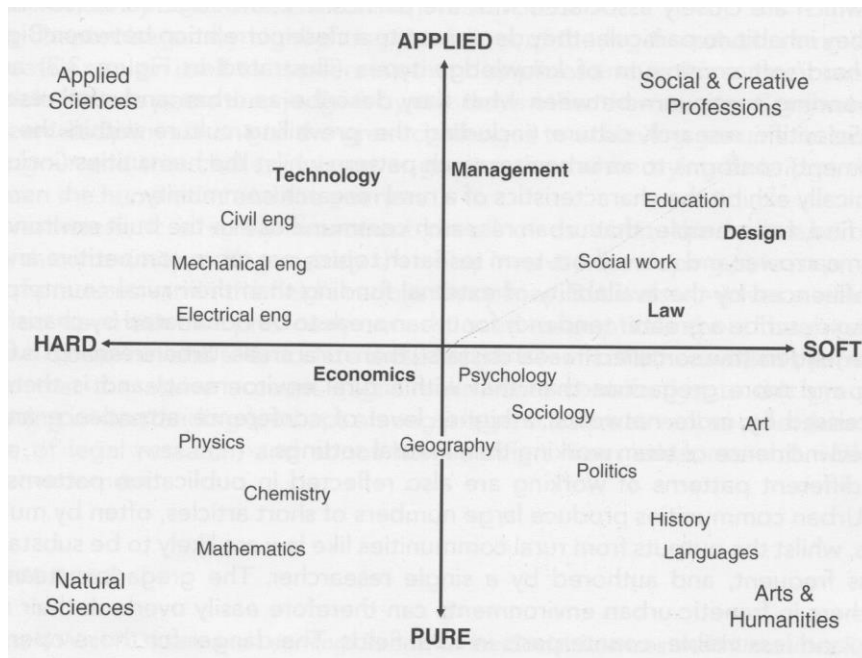


Figure 5: Disciplinary model (Biglan, 1973)

The author's ontological and epistemological attitude dictates the path which determines the strategies for this research, the choice of methods, as well as techniques and procedures for data analysis and collection. Subjectivism is usually associated with qualitative inquiry (Berger and Luckmann, 1967) and in this research, it is the dominant method used. However, this does not mean philosophically speaking that objectivism has been disregarded and entirely replaced. The combination of this midway epistemological stance with intermediately positioned ontology is referred to by Barrett and Barrett (2002, p.763) as a 'pragmatic –critical-realist' position

3.2 Theoretical perspectives

The theoretical perspective of the methodology adopted for the research programme was founded on the epistemology outlined above. It sits broadly within the realm of interpretivism where there is clear distinction between the natural and the social worlds. Grix (2004) stresses this demarcation is not clear cut, however, one cannot draw from a positive theoretical perspective as well because the two standpoints are logically incompatible. The methodology used rests on the social construction of reality (Bynner and

Stribley, 1986), Building Control bodies and Building Regulations are human constructs; they do not stand apart from one's knowledge of them. The fact and value debate is underlined by the interaction of the actors in the field, particularly since it may be argued that they reside on two different sides of the regulatory divide being either regulators or regulatees. Traditionally, objectivity and value freedom were regarded as equivalent (Williams and May, 1997, p.130) therefore, any investigation or inquiry should be conducted with an awareness of the researcher's own values as well as those of the participants. Mere reporting of the data collection only provides explanations, what is required and what should be the principal intent of any research is a thorough understanding and not just observation.

The reasons why more economic resources are used in achieving compliance in domestic extensions, through extra unspecified site inspections and compliance procedures, requires an internal examination that has to be explored from within the setting and by the use of methods different from those in the natural sciences (Eraut, 2007). Within any research, one should realise that the investigator is not detached from the actors being researched and actually forms part of the social reality being investigated. The researcher recognises that 'the findings of social sciences very often enter constitutively into the world they describe' as Giddens (1984, p.20) contends, and thus appreciates the author's reasoning concerning the double hermeneutic; interpretation is a two-way process. The social scientist's jargon, definitions and so forth are interpreted by the participant just as much as the social scientist interprets the participants and thus, there is an interaction of content and denotation. The researcher was aware of the formation of embryonic hypotheses traditionally associated with a deductive rather than an Inductive method of research (Smith, 1980, p. 40). This was influenced by suggestions of actors within the field of construction that it was self-evident that inferior builders were the primary cause of regulatory problems. A second proposition sometimes voiced by members of the public was that the inefficiency of Local Authorities caused an imbalance of financial resources. The researcher aspired to generalise

from the empirical data that was produced, but it would be misleading to state that these simplistic presumptions have not come to mind at times during the research. This was especially the case when confronted by sceptical colleagues who viewed the task of seeking other contributory factors to the problem as a waste of effort.

3.3 Research strategies

The following strategies were contemplated and subsequently reflected upon in the light of the researcher's own philosophical positioning to determine if they were of acceptable practical use in the field and for the future analysis.

Unique Adequacy

Rooke and Kagioglu (2007) outline Unique Adequacy requirements for methods derived from a setting should be used to analyse that setting. This strategy could be applicable to the research that may be required for a preliminary study through the possible use of documents, cases, and circumstances involving the researcher and his own practice. However, the insider setting would clearly not be the absolute operational extent of the main research as the inputs, actions, and views of third parties would have a major significance and have to be taken into consideration. The overall study itself would aim to draw on concepts and theories that do not form part of the setting; plans to venture this route were considered circumspect for these reasons.

Action Research

Action research was discounted although this has often been a favoured methodology within public sector organisations (Fox Martin & Green, 2007). Local Authority has been and still is experiencing many transformations, adaptations, and change. Some permanence and stability within the environment being researched is required for social observation but with the major changes in Local Government, this is no longer applicable. If this

strategy were adopted and employed within the researcher's own practice it would give rise to potential difficulties. The research would concentrate on an insubstantial section of the population and provide little possibility, in the short term, in altering any fundamental arrangements within the practitioner's workplace. There would also be fundamental difficulties in achieving any generalisability from the data analysis while the geographical extent of the problem could never be determined.

Ethnographic Research

The researcher is a regulator involved in the day to day operation of the Building Regulations but was previously employed in the construction side of the industry and in that capacity was a regulatee. Although immersed in the practice culture of the industry as an insider at the micro level and an outsider at the macro level an ethnographic strategy was considered unsuitable for this project. The research objective is not looking specifically to find power patterns or identity formation, as Crotty (2011, p. 155) contends, 'striving solely to see things from the participants' perspective.' The position and conceptions of both sides of the regulatory regime are imperative if the research is to move forward. Time restraints are another factor which does not permit the researcher to spend extended stays in the field as the research has to be fitted in to leave patterns and non-working hours. Most importantly the limitation of more than one intact cultural group to observe amplifies the argument that ethnographic research is not a suitable methodology in this particular case.

Experimental Research

Experiment as a strategy divorces phenomenon from context. Studying samples of the population via a survey, a numeric description of trends can be established through experimental measures, testing the treatment of outcome by control of the influencing factors (Creswell, 2009). In this inquiry, any surveys of the actors involved would have to be case specific, due to time constraints, and, therefore, there could be no manipulation of the variables, for that reason alone the strategy has not been considered. Fear

regarding internal validity which is associated with this method (Fox et al., 2007) and quasi-experiments regarding separate treatments or control groups are additional reasons why this tactic has been passed over.

Grounded Theory

Grounded theory disputes the traditional research model by not commencing with a hypothesis but once the data is collected then seeks relationships between concepts. This research methodology is contested in academia as some aspects of grounded theory method do not conform to the traditional conventions of academic research (Bryant and Charmaz, 2007). Yin (2009) emphasises the difference between grounded theory and case studies in the role of theory development before the data collection. However, as Glaser and Strauss (1967) generalise, the process of inductive theory building should emerge from the data and not some other source. Theory is something the researcher creates from the data (Gillham 2009, p. 12). By working inductively from what there is in the research setting, a grounded theory is developed, that is one that is grounded in the evidence. The researcher had a theory that it was substandard Builders who were responsible for all problems, predominantly due to the fact this was an accepted view in practice reinforced by numerous programmes in the media, (e.g. Bad Builders, 2015). Academic study and reflection prompted a realisation that this discriminative attitude could have an adverse effect on the study and prejudice outcomes. It was decided that the incorporation of a grounded theory strategy into the methodological considerations had certain advantages. Primarily it has the potential to break new ground and unlock old problems but also builds theory rather than tests it (Barrett and Barrett, 2003).

Thematic Analysis

Thematic Analysis concentrates on examination of themes within the data. It goes further than enumerating phrases and words similar to N-Vivo computations and endeavours to discover and specify ideas within the data both explicitly and implicitly. Themes are patterns across data sets that

become categories for later analysis. Thematic analysis is thought to be an advantageous method of engaging the entangled meanings found in a data set. The identification of themes is dependent on the researcher's judgement for it is not just their frequency that determines their importance but how they provide an accurate understanding of the problem investigated. In qualitative research, thematic analysis is the most common form of analysis (Guest, 2012) it is a worthy strategy for consideration within the non-quantitative part of the research as well.

Case studies

Case study strategy involves empirical investigation into a small number of cases in naturally occurring situations. The detailed information regarding a significant number of features collected contributes to the notion that qualitative data can be seen as more important than the quantitative. Through these longitudinal studies, attempts can be made at transferability of findings or naturalistic generalisation (Gomm et al., 2000). Yin (2009) identifies three forms Descriptive, Exploratory, and Explanatory. Van Teijlingen and Hundley (2001) argue that case studies are useful tools for trial runs or feasibility studies as well as any main research programme whilst Flyvbjerg (2006) contests the notion that you cannot generalise from a single case study. Explanatory and Descriptive types of case study should prove useful as a strategy both for the main body of investigation and any preliminary study for identifying causal processes.

Surveys

Questionnaire surveys may furnish the means of providing descriptive statistics by which the pattern of responses can be summarised. They are most effective when used in conjunction with other methods and as Grix (2004) mentions "especially with one or more varieties of interview techniques." Survey can be an ambiguous term in this context because to actors in practice the term usually implies an inspection of a building or construction project. Barrett and Barrett (2003, p.755) point out that only when there is an effective dialogue developed will research impact on

improvements in practice. Therefore, a survey in the context of construction can be defined in structural terms as the agency of the actual inspection and examination of the constructed project, in this situation; it is a physical occurrence and not a social interaction. Therefore, practitioners in the Built Environment may have to refer to the designation 'survey' in either social scientific or general construction terminology.

Archival Retrieval

This strategy forms an important component of some types of research especially those whose time horizon is more historically inclined. Checking files and documents to verify and authenticate features identified within a study is regarded as an essential tool for ensuring the accuracy of the research. This is viewed by the researcher as a key requirement to corroborate and help make sense of the data collected by other methods. However, these primary sources cover a broad range of material and variations country-wide, which has implications for the decisions on which archival files are to be scrutinised (Grix, 2004).

3.4 Methodology of the present research

From the exploration of the various strategy options outlined above a more focused system of operation lying between deductive and inductive approaches emerged. Epistemologically based midway between positivism and interpretivism, ontologically between objectivism and structuralism, philosophically based as pragmatism.

A preliminary investigation was considered the most efficient procedure because it could provide advance warning if the proposed methods were inappropriate and permits the pre-testing of the research instruments (Baker, 1994, p.182-3). Inquiry can cover both substantive and methodological issues (Yin, 2009, p. 81), and on reflection, the combination of both quantitative and qualitative approaches was considered the appropriate procedure. The Kaleidoscopic Research Model championed by

Barrett and Barrett (2003) permits a continuum of methods and methodologies. By combining approaches, they hold that an effective dialogue can develop between practice and research. From mono-methods to multi-method choices Cameron (2011, p.96) argues that Mixed Methods is a rapidly growing third methodological movement which has developed its own methodological foundations and constructs. Taking a practical approach, pragmatism bridges the gap between paradigm and methodology (Cameron, 2011) whereas Greene and Caracelli (2003) contend it is a stance at the interface between philosophy and methodology. This pragmatic approach can be supplemented by other epistemological options, such as positivism, within the Kaleidoscopic Research Model (Barrett and Barrett, 2003, pp. 761-2). This continuum, like the methodological one, permits the application of differing strategies and for the preliminary study a periscopic view, through the medium of one case study, highlighted the causal factors in a project that was already known to have economic resources overruns. This technique has been used for many years in social science research and can illuminate rich circumstances of reality within a particular data boundary according to Sutrisna (2012) though there can be problems in generalising the findings outside the researched case. In contrast, a microscopic view was taken through the use of questionnaires to evaluate the commonality of the issue of extra resource use, and its geographical extent. This proved an ideal strategy for the preliminary study; analysis verified the phenomenon of extra resource use encountered in practice locally was experienced in a wider geographical context. Questionnaires are the most widely used survey instrument and the design specifically concentrated on their repeatability and data categorisation (Sutrisna, 2003). They were not multiple choices, but were clear, unambiguous, and easy to understand (Kumar, 1999) and answered by respondents who possessed an expertise and clear knowledge of the subject. The questionnaires were not self-administered as this may have introduced uncertainty regarding data validity issues. To limit normally low response rates associated with this type of research opportunities were created to meet the respondents face to face when the researcher visited

the offices of the selected Building Control bodies within the county. Finally, these approaches were supplemented by the investigation of archive records to help ascertain the current and historic degree of the resource use overruns. Unexciting compared with the fieldwork and not the primary research tool, as is often the case in archival retrieval, but some contextual research was thought necessary to fully understand the setting. The records investigated were both paper and electronic documentation.

It was envisaged that the output of the preliminary study should assist in refining the second stage of the research. The case study highlighted areas of non-conformity with the Building codes that gave direction to further areas of investigation. Practical procedural problems were identified which were taken into account when the primary research commenced. The reasoning behind questions advanced during the interaction with the Building Control Officers was to establish if any other issues required addressing in a more substantial manner. Also, they could provide advance warning of potential failure of the main research project, and highlight inappropriate or complicated methods (Teijlingen and Hundley, 2001). The archival retrieval furnished grounding into searching out specific files and data from Local Authority administered archives and provided an opportunity to discover potential variance in localised mechanism regarding procedures and storage.

Synthesising the methodological approach of the preliminary study with the main body of the research was the next subsequent operation. Yin (2009, p. 28) states all empirical research has an implicit if not explicit research design. In this context, the research question concerning the causes of extra financial resource use in achieving compliance gave rise to reflection on what phenomena plausibly influence these occurrences. Thinking deeply regarding this proposition the three themes, as outlined in the literature review, formed the basis of the search for grouping the influencing factors and identifying the causes of extra resource use and constituted the foundation of this inquiry. The three themes were established through,

experience derived from practice, interaction with other actors in the industry, and reinforced by the literature. They were identified as themes at a semantic level, so the research was focused on the explicit meaning of the data and not for anything beyond (Boyatzis, 1998). It was envisaged further influencing themes would emerge during the subsequent investigation and patterns develop beyond the semantic content of the data to permit analysis of underlying ideas at a latent level.

Particularly influential at the commencement of the programme was the Building Regulations Advisory Committee report (Communities and Local Government, 2012b), see the Literature Review 1.13, a document whose main objective was to consult about proposed changes to the Building Control system which might lead to the improvement of the overall service. It was hoped in the researcher's own practice that this document would have the potential to deliver solutions to problems particularly appertaining to domestic extensions and minor works. Unfortunately, this did not occur because the report lacked methodological strength, for example, it did not state the response rates or sampling strategies. Local Authority groupings as an entity were predisposed to reply to the questionnaires as they accounted for seventy-three percent of the responses. Though the report was issued by an organisation that has kudos and authority, it provided a lesson in the differences between research in industry and that undertaken in Academia. The researcher was conscious of these failings and did not wish to make similar mistakes. Nonetheless, it provided a starting point from which to evaluate prevailing research techniques. The present inquiry has endeavoured to illuminate the causes of a specific problem that affects Building Control's purposeful operation founded within a defined category of construction projects. The research is more precisely objectivised and in its enhanced strategy lowers the connotation slightly by limiting the amount of relationships whilst the phenomena and entities investigated aid provision of results and improve applicability.

Evidence that research and best practice initiatives by actors in industry have failed to achieve substantial improvements and that there is a long-running debate why academic research ideas fail to be implemented have been highlighted by Barrett and Barrett (2003, p.755-6). The authors contend those in industry are often discontented with the contribution of research, it being either too theoretical or that suggestions fail to work in practice. From experience in practice, most Building Control Officers and management require straightforward guidance; practical solutions to problems, and recommendations that are easy to comprehend with supporting details of how they should be applied. The aim was to improve the interface between academic theory and workplace practice, use of the methodology suggested by Barrett and Barrett (2003) for linking research and practice through their Kaleidoscopic Research Model was judged the most appropriate methodological position. This fits well with the investigative role of the researcher immersed in the subject and the methodology of descriptive case studies characterised by their periscopic approach but augmented by archival retrieval and on-site physical building surveys. As Murray Thomas (2003, p. 6) argues “Most authors today see qualitative and quantitative approaches as complementary rather than antagonistic.”

The research design of multiple case studies justifies the replication logic as outlined by Yin (2009, p.53) and the evidence produced is considered more compelling than single case studies. The linking of the data to the proposition is achieved by pattern matching; the logic being that an empirically based pattern can be compared with the alternative predictions (Yin, 2009, p.109). The following sample strategy was chosen as it permits claims for generalizability. One case study was randomly selected from six Local Authority districts in the Southwest region which consisted of 29 District Councils (LABC, 2008). They were chosen specifically to incorporate the varying types of administrative characteristics that public sector Building Control units operate under and took into account population densities and commercial/business composition. The selection process of the Building

Control bodies was also constrained by the researcher's desire to pre-empt accusations of bias, where unit managers were known personally through professional dealings, interactions through the RICS and CABE, or had been employed or trained by the author's own practice then they were excluded.

Approaching the Building Control bodies directly to select a case was dismissed as an option due to the possibility of their partiality in choosing projects. The researcher wished to ensure that case nomination was an unordered event and was especially concerned that identification of cases by the relevant bodies might lead to preferential assignment by them. The solution was to adopt a random sample approach and the local Planning Applications registers, which are in the public domain, was regarded as the most appropriate avenue for selection. Applications for the year 2010 were considered a suitable time frame; this provided a sufficient interval for approval or rejection of the application and if Planning Permission was granted an adequate period for the construction and completion processes to be accomplished.

Appointments were made to interview Home Owners in their own houses these were tape recorded, and notes were taken by the researcher. The interviews were semi-structured, this method was chosen as it allowed any ambiguity in the questions to be explained, had the advantage of repeatability, and permitted other avenues to be explored. There could be potential difficulties in coding, but it did permit participants to communicate a more precise account of their viewpoints. Home Owners were sent details of the research programme and consent forms to complete (Appendices 6 and 7). Questionnaires were considered unnecessary as all participants were subject to interview and thus eliminated concerns about the interpretation of the questions, misgivings about sampling strategies, and response rates. The interviews with Home Owners were programmed to be conducted at a place and time convenient to the participants. In accordance with data protection legislation interviewees were requested to sign a consent form

(Appendix 6) to permit the researcher to view the Building Control files concerning their extensions. The names and contact details of their Builders were requested whilst the Designers' names were already contained within the Planning documentation. Builders and Designers were contacted by e-mail or post to arrange an interview appointment and provided with particulars of the research programme (Appendices 1, 2, 5, &7).

The researcher was aware of endeavouring to generalise beyond the setting of the cases. Cross-case analysis assists in establishing if there are generic trends from which generalisations can be concluded. The case-based reasoning is a tool through which problems can be solved, anchored on solutions to similar problems in the past. The researcher acknowledges that there may be criticism of anecdotal evidence and non-representative selection strategies that have to be addressed. The outcomes should form the basis of systematic changes within the researchers own practice. The recommended solutions were tested against theory to determine their generalizability for potential use elsewhere within the Building Control System. The development of theory not only helps generalisability but also facilitates the data collection phase (Yin, 2009) and thus becomes the main agent in achieving results.

The multiple sources and chains of evidence that were gathered during the data collection period were sufficiently robust to ensure construct validity. Internal validity was verified during the data analysis by pattern matching, through which the empirically based patterns could be compared. Replication through multiple cases ensures external validity because analytical generalisation is not automatic from a single case as Yin (2009) states theory must be tested by the findings of the remaining cases. Reliability was secured by developing the database, the dependability of the evidence collected, and by the use of case study protocol ensuring the consistency of the results extracted.

The examination of the documentation regarding domestic extensions inspected by Local Authority Building Control together with the conducting of interviews has formed the foundation of the research programme. The structural surveying of the domestic extensions investigated, combined with archival retrieval permitted the gathering of some contextual intelligence; which was reasoned a pragmatic way to consolidate the data. This rationale relates to the researcher's own sentiment that the most practical way works best and is reinforced by the views of Amaratunga et al. (2002, p.23); building on this strategy whilst strenuously acknowledging that preconceived ideas can handicap the emergence of fresh concepts that might arise from that material. The interview visit to each Home Owner provided an opportunity to conduct an on-site survey of the extension both structurally and for regulatory conformity. It also furnished time to peruse personal documentation relating to the project with the permission of the Home Owners.

Grounded theory works almost in reverse to the often accepted methodology in social science research by starting with a question rather than choosing an existing theoretical framework and proving or disproving it. The researcher is, therefore, conscious that interpretation of meaning is paramount. Glaser (1992) qualifies this stance by highlighting the interrelationship between meaning in the perception of subjects and their actions. The systematic generation of theory from data incorporates both inductive and deductive reasoning, combined with a pragmatic epistemology and thereby fits the periscopic characteristics of the Kaleidoscopic Research Model. Once the raw field work data was collected it was coded allowing key points to be gathered and broken down into conceptual components which were then constantly compared. The open or substantive coding process which was the first level of abstraction moved from individual cases to axial coding where ideas and concepts from cross case analysis emerged. After the core variables were found selective coding followed which delimited the study and helped in producing insights and findings (Elliott and Higgins, 2012).

Coding using the N-Vivo program was envisaged as a constructive way to assist data analysis. However, potential problems have been highlighted with this procedure. Kelle (1995) points out it is an automated analysis system, and Li and Seale (2007, pp. 511-526) have criticisms of its micro-analysis. A supplementary technique helped to facilitate deeper inquiry into tacit themes and thematic structures. The use of Thematic Analysis which is not bonded to a specific theoretical position (Joffe 2012, pp.209-223) and can be utilised within a diverse sphere of theories and epistemological approaches and was considered an appropriate aid to achieve this goal. It was envisaged that by going beyond documentation and content analysis whilst combining analysis of more tacit meanings interwoven by the literature the process of social construction of additional resource use could be more richly illuminated.

Gibbons et al. (1994) emphasize in their mode 2 theory of knowledge the need for context-driven research which is problem focused and interdisciplinary. There is a need to balance the knowledge that contributes to short-term problem solving with the requirement for academic research which furnishes generic understanding (Green et al., 2010). Contextualist research has been advocated as an alternative approach, whereby researchers iterate between alternative theoretical frameworks and emergent empirical data. As Green et al. (2010) contend regarding the importance of orientation towards mixing methods thereby overcoming the existing tendency to dichotomize quantitative and qualitative approaches. They also stress their caution regarding replication of the analysis process of interview transcriptions through software packages such as N-Vivo (cf., Dainty et al., 2000).

Archival material from the Building Control bodies involved in the cases was researched during the visit to their respective offices. Details of cost overruns and their magnitude, when they occurred on the projects, were investigated and the opportunity taken to gather information on each specific

case as well as an overview of the administration. Supplementing this data, any personal documentation held by actors that were available was used to aid the determination of factors and agents of additional resource allocation. The material found through these sources enhanced validity and reliability by triangulation. However, the author is aware that two sets of data or methods may not provide comparable information about the same phenomenon, and therefore, one cannot expect straight forward corroboration (Mason, 1998). Archive retrieval can be consistent with grounded theory where little is known about a particular situation or phenomenon and so helps to discover concepts and develop theory (Gilliland, 2011). Though the archival records were used in conjunction with other relevant documentation, as Yin (2009, p.88) states the investigator must be careful to ascertain the conditions it was produced in as well as the accuracy of the evidence. In addition Grix (2004, p.135) highlights how necessary it is to check that the methods used are ontologically consistent with one another, and as a consequence, whether they are epistemologically consistent. The researcher proceeded on the conclusions of Flyvbjerg (2006) who states “good social science is problem driven and not methodologically driven in the sense that it employs those methods for a given problematic,” best helps answer the research question in hand.

Conscious of the fact that Kaleidoscopic Research Model permits different epistemologies and methodologies but provides a combination of three different approaches it was expected that enhanced results would emerge in comparison with the use of one exclusive methodology. The researcher is aware that triangulation through the use of different methods often finds its main value in disconfirming the tenability of arguments that findings are artifacts of particular methods (Smith, 1981). Further the definitions of theory construction range from, ‘a set of statements or sentences,’ ‘symbolic constructions,’ and ‘a summary of the known facts,’ to the employment of concepts’ (Shaw and Costanzo, 1972, pp.7-8). The use of Grounded Theory was not as useful or practical as first envisaged especially as the researcher had already formulated preconceived categories. The attempt to bridge the

gap between theory and research though partially unsuccessful has not been omitted from the thesis on the rationale that it is preferable to be candid about ones misjudgements. However, the overall formation of the methodology for this research was sufficiently robust to lead to the identification of the factors that cause additional resource use and thus fulfils the aim of objective 3 (1.4).

3.5 Ethics

A number of ethical issues have been considered, primarily interviewees' participation was voluntary, that they were not coerced in any way, and provided their informed consent. Also, there was no risk of harm to those taking part, they were assured of confidentiality, and would remain anonymous except to the researcher. Further ethical considerations were accommodated in accordance with Bell and Bryman (2007, p.67) these included protection of privacy, respect for dignity, declaration of conflict of interest, and that communications should be done with honesty and transparency. In the preliminary study, the research followed the guidelines laid down by the ESRC and the code of conduct of the RICS. Ethical approval for the remainder of the inquiry was granted by the University of Salford for research with human subjects and carried out in accordance with the University's code of ethics, the Letters and information documents (Appendices 1-7) have also been verified by the Academic Audit and Governance Committee. No changes to the project or its methodology have occurred since approval on 24th August 2012, Rep Reference CST12/8.

3.6 Study limitations

The study is limited by the research design and the selection of field work locations (Gillham, 2009). The empirical data was sourced regionally and as stated previously there are nominal geographical variations between English Local Authority Building Control regions and some population diversity. It was not the aim of the enquiry to establish a national view concerning

resource use in domestic extensions, but to demonstrate the influencing phenomena are not just localised to one practice area. The data collection was specific to Local Authorities and, therefore, concentrates entirely on public sector Building Control, although the findings should have relevance to private industry. Within Local Councils, there are divergent organisational mechanisms for operating the Building Regulatory function, and it was deemed essential to format a case in each of these varying types of Building Control establishments.

The case studies were not selected as representative samples, but as Angell (1936) cited in Ragin and Becker (2009, p. 23) states, 'this should not be an issue because the aim is analytic rather than enumerative induction'. Criticism may be levelled at the topic choice, for it could be considered too narrow and that financial resource allocation issues should be addressed in a broader context. The study has not concentrated on macro policies though it does look succinctly at economies of scale, administration and, management factors and their prominence. However, the structures and composition of these elements are often already well established and documented through current management and personnel literature (e.g. Communities and Local Government, 2012a and 2012b). Failures in endeavouring to implement these instruments by Building Control bodies are often due to overcoming the political constraints inherent in bureaucratic institutions. A danger that the researcher is aware of in the possible fulfilment of proposed solutions to problems identified in this research.

4.0 PRELIMINARY EXPLORATION PHASE

4.1 Introduction

A pilot study often referred to as a feasibility study is a crucial element in any good study design, a view shared by van Teijlingen and Hundley (2001). However, it is also an opportunity to pre-test a particular research instrument and give warning of potential complications or inappropriateness (Baker, 1994, p.182-3). The main reasons to undertake the pilot study were to develop and test the research instruments, assess the feasibility of a full-scale study, design and then assess the research protocol, and establish the techniques and effectiveness of the sampling frame. Logistical problems and difficulties in data collection and analysis were identified. Problems regarding the convincing of stakeholders or funding bodies as outlined by van Teijlingen and Hundley (2001) did not arise. The aim was not only to test the water but also to provide the researcher with some practical research experience. There was a steep learning curve on the part of the author, but valuable lessons were learnt regarding the direction of travel and particularly time management concerns. This was the principal reason the findings of the pilot study have been included in this thesis, 'it is important to ensure lessons learned with respect to research methods are shared - many researchers re-invent the wheel without having an opportunity to learn from other people's experience' state van Teijlingen and Hundley (2001p.3). The issues encountered contributed to the formulation of a more realistic approach to the main study, not only in conditions of breadth and depth but in functional terms of what could be achieved. At the commencement of the study the researcher held an optimistic outlook in terms of what could be accomplished but became aware, especially in phase two, of the difficulties in gaining access and contact generation besides the challenges of data interpretation.

4.2 Preliminary Exploration

The preliminary exploration was undertaken in two sectional phases. **Phase one** of the exploration was a case study concerning a domestic extension project controlled for Building Regulations purposes within the researcher's own practice. This was a project where a legal enforcement notice had been served because of contraventions of the Building Regulations. This particular case had resulted in an inordinate use of extra economic resource allocation by the Local Authority Building Control unit and was one of the largest loss-making domestic extension projects that the unit had encountered for several years. Due to the excessive administration costs involved it was considered an appropriate case to use for identifying potential factors for further examination in the later stages of the research. The literature identified a number of possible influencing factors that give rise to non-compliance particularly concerning participant involvement and conflicts between the regulator and regulatees (May, 2004). For practical purposes, it seemed prudent to divide the persons involved in the project into two groups. They were more simply identified as *Building Control Officers* (regulators), *Builders*, *Designers* and, *Home Owners* (regulatees). Gunningham (1987) recognises the important affect that the type of regulatory body has on outcomes for it is not just the regulators as actors themselves who exert influence on events, so an additional area of investigation assigned, *Administrative Authority* was established. The nature of regulatory codes themselves affecting outcomes was argued by Ayer and Braithwaite (1992), and that too was included as a category of analysis, *type of regulation*. From personal experience in practice projects that are undertaken by the Building Notice route rather than the full plans process anecdotally appear more problematic (McAdam and O'Neill, 2002) so another category was introduced, *type of application*.

Phase two was conducted at the offices of three different Local Authorities in one English county. These were selected to establish if the problem was geographically widespread and not just localised to the Authority where the researcher was employed. Questionnaires were given by the researcher to

twenty-five Building Control Officers employed by those Authorities. The unit managers gave permission for the surveys, and there was a one hundred percent response rate. The reason for this result was the researcher visited the three Departments in person to hand out the questionnaires. A much greater feedback rate than normal was achieved than when there is a random and anonymous mail out. Vaus (1996, pp.100-103) states that response rates can be very low (20-30%) requiring a larger sample to compensate. The researcher was aware of criticisms that participants subordinate themselves to the subjectivity of the researcher (Alvesson and Deetz, 2000, pp.166--170) but in this inquiry, the choice of replies was from the entire range of construction types that regulators normally deal with. The primary aim of the canvassing was to verify the emergent proposition from personal practice that the problem of additional economic resource uses for Local Authority Building Control is most acute concerning domestic extensions. The questions sought to attest what type of construction project that Building Control Officers perceive require the most supervision in relation to economic resource income. What kinds of projects were mostly likely to have a negative financial impact on the department and more explicitly in what type of project did the most non-compliance problems occur. An ancillary purpose was to seek the opinions and views of the Building Control Officers regarding the issues that arose from the case study in phase one. The archive records of enforcement action for non-compliance with the building codes and documents concerning the serving of notices for non-conformity were also examined whilst in the offices of each Building Control body.

4.3 Phase 1 Pilot case study of a domestic extension

The four primary actors involved in the project were chosen based on the social theme from the literature review they were Home Owner, Designer, Builder, and Building Control Officer. The data collection in this instance was used to ascertain if there was a need for the inclusion of any other participants in the future research. The governance theme was also built

from the literature review and the data generated helped assist the setting out of the subsections of that theme more logically in the main body of the research. The data from the third theme technical complications, because the case was already known, did not aid the researcher in assessing the difficulties in collecting the relevant documentation when viewing the archives of other Local Authorities.

A Full Plans Building Regulations application was submitted to the researcher's Building Control unit for an extension to provide additional living accommodation to a single storey eighteenth-century lodge. Drawings were lodged for the proposed project by a Chartered Architects practice (Designer) acting as agent for the applicant (Home Owner). Building Control checked these proposals in less than two weeks, a thirty-point checklist of items that required rectification was then mailed to the Designer. When the statutory eight-week decision time was due the plans were refused by Building Control because the items on the checklist had not been amended or rectified by the Designer. Work commenced on site at approximately the same time, and the Builder and Homeowner were informed by the Building Control Officer on his first site visit that the plans had been rejected. The Builder carried on with the construction work whilst the Home Owner dismissed the Designer and appointed a replacement who was a sole architectural technician. Fresh plans were submitted to Building Control and conditionally approved, subject to Structural Engineer's details for the roof; (it was the responsibility of the new Designer to obtain these calculations). The Home Owner was dismayed that the new Designer had not already engaged a Structural Engineer simultaneously as the plans were redrawn, so decided to employ a Structural Engineer directly himself.

Construction works progressed and in the absence of structural calculations, at that time, the Builder proposed an over engineered roof design to which the Building Control Officer agreed, and so the works were able to continue. When the roof carcassing was complete, the Builder left site and a subcontractor undertook the task of slating the roof. At the next inspection,

the Building Control Officer noted the coursing of the slates was out of alignment but this was not a contravention of the regulations. However, he identified pyrites in numerous roof slates, a contravention which concerned resistance to contaminants and moisture (Approved Document part C) and requested the Home Owner instruct the Builder to replace the faulty ones. The Home Owner relayed this information to the Builder but stipulated he wished the whole roof to be recovered. In addition, he demanded the roof timbers be replaced and installed as specified by his own Structural Engineer's calculations which had arrived after the roof had been completed. The Builder requested the subcontract slater to return and rectify his substandard work but the slater, who had been remunerated by the main contractor, had subsequently gone bankrupt and refused the request to return. The Builder said he would personally replace the substandard slates but leave the coursing as it was. He argued the roof structure was in conformity with the Building Regulations and would not alter it because he had not received any structural calculations until after his work had finished. After some weeks of dispute, nothing was resolved and no remedial works had been undertaken. The Local Authority Building Control as the Enforcement Authority served a notice, sec 36. Building Act 1984, to replace the faulty slates and bring the work into compliance. The notice by law had to be served on the Home Owner, who was legally responsible as the applicant for the project (Building Act 1984).

A site meeting was held with the Home Owner, the Building Control Officer, the Structural Engineer, and an independent slate specialist. The outcome of which was that the Structural Engineer employed by the Home Owner agreed with the Building Control Officer that the over engineered roof timbers met the requirements of the relevant regulations structural safety (Approved Document part A) and there was no regulatory or structural need for any replacement works. A slate specialist employed by the Home Owner agreed that the coursing was incorrect, there were pyrites in some of the slates, and in addition, commented that the battening was Russian and not Baltic pine as specified in the bill of quantities (this issue was not a

contravention of the Building Regulations). The Home Owner subsequently took the case to arbitration. It was found that there was no integral difference between the two types of pine battening. The Builder though had a duty to use the type of battening specified in the contract and to cover the roof in a workmanlike manner with slates that were adequate. The Builder recovered the whole roof properly coursed with the specified battens and slates without pyrites. The contravention notice was withdrawn by Building Control, and the project was completed successfully.

Home Owner

Over a period of time, he became distressed and displeased because the original Designer or his practice had let him down and had not for some reason, perhaps work overload provided a service one would expect from a Chartered Architect. The plans had many omissions and faults, and the Designer failed to rectify or amend these details within the specified two-month decision time frame permitted under Building Control legislation (Building Act 1984).

The second Designer commissioned failed to obtain structural calculations for the roof members at the time he redrew and submitted drawings.

The Builder went ahead without Engineers calculations and changed the roof design in agreement with the Building Control Officer, but both failed to inform him of this action.

The roof slating undertaken by the sub-contractors was substandard. The Home Owner received an enforcement notice from Building Control to rectify the works. He believed that the Local Authority should have prosecuted the Builder, which they had no statutory power to do.

Designers

From experience in practice, it is unusual that a Designer should have submitted drawings that required such a number of amendments to achieve conformity. Normally corrected drawings are resubmitted as soon as practical and the amended plans sent in before the statutory time limit for determining the application expires. This was not the standard of care conventionally expected of professional Designers. Therefore, there were grounds to sympathise with the Home Owner's decision to dismiss the first Designer.

The second Designer appointed, knew works were proceeding on site and should have engaged a Structural Engineer immediately. He was not qualified to personally justify the structural roof design, but was duty bound to make sure sufficient information was available for the Builder to undertake the works correctly and for Building Control to approve his plans.

Builder

The contractor or his operatives were on site most of the time and would normally seek to achieve a good client relationship. Therefore, the Builder should have explained to his customer he had not received Structural Engineer's drawings from the Designer but agreed on a method of overcoming the structural roof problem with the Building Control Officer.

The Builder or one of his employees should have checked the sub contractor's slate and battening work before authorising payment for the work. He would then have seen the pyrites and poor coursing, as well as the use of the unspecified type of battening. This was an omission due to a matter of trust; the fact was the subcontractor's work had previously been to a high standard on other projects, and so he thought it unnecessary to check the work.

Building Control Officer

He did not inform the Homeowner that a new type of roof construction had been agreed on site with the Builder. The Structural Engineer's calculations were of no use except to provide approval to the original drawings as they arrived after the construction of the roof had finished. He did not inform the Home Owner of the Council's policy to issue an enforcement notice; the Authority is barred by statute after six months from enforcing rectification procedures and would lose its legal power to achieve compliance if it did not act. However, as often a Home Owner is not present during a Building Control Officer's site inspections it may have been beneficial to enclose a letter with the enforcement notice explaining the procedures, legal responsibilities and, reasons why the enforcement action took place.

Administering Authority

There is scope for amending the procedures within the practice. An alternative protocol adopted by some other Authorities is to reject the Designer's application when a checklist of non-conforming items is sent out. If this custom was embraced then, the Home Owner would have known at least six weeks previously that the drawings had been refused. The researcher's practice chooses to maintain a more cordial approach with Designers preferring to nourish dialogue and interaction so that drawings can be amended and brought into conformity and approved.

A sec 36 notice Building Act 1984, notice was served with no explanation for the policy reason for this or an explanation why it is served on the applicant rather than the main contractor.

A policy alternative could be to place a charge on the land register stating the works remain in nonconformity and would not be removed until they comply. Another course of action is the Authority could write to the Home Owner stating they refuse to issue a certificate of completion until the works

conform. Both these measures would make the subsequent sale of the property difficult.

Building Regulations

Submitted drawings received by Building Control from Designers are expected to conform to the relevant building codes, and this did not occur. Both Designers and the Builder had access to the Approved Documents and had knowledge and understanding of the requirements of the Building Regulations. They all had familiarity with the systems and documentation regarding obtaining any additional information details to achieve conformity. There appears to be no evidence that the building codes were a problem to the professional actors engaged in the construction and design processes.

Type of Application

The majority of professional Designers use the full plans route (Communities and Local Government, 2009a) when submitting a Building Regulations application. Therefore, there would be nothing unusual in the Designers using this procedure. The use of the alternative route that could have been used, Building Notice, may have been more beneficial. There would have been a cost saving in not having structural calculations and if there were no specifications there would have been no problem regarding the type of battening.

Digest

Stepping away from the exposition of the data a number of themes emerge drawn from the interaction of the participants particularly concerning communication or its breakdown and the procedural knowledge base of the actors which seem to be a cause of some of the problems. Reflecting on how this may have occurred from the literature, Cooper (2013) demonstrates how disappointments may arise for Home Owners because of their high expectations of the Building Regulation, whilst knowing the rules tend to make expectations more realistic (Winter and May, 2002). Errors, omissions, and mistakes by Architects highlighted by Guckert and King

(2002, p.48) emphasise some of the ivory tower attitudes attributed to Designers in their research. The big divide between professional and technical skills in the construction industry in England is a further area that potentially may cause information breakdown and knowledge deficiency (Clarke, 2006). Mayhew and Quinlan (1997) argue that subcontract operatives constrain regulatory communication.

4.4 Phase 2 Questionnaires and archival retrieval

The data from the archival retrieval assisted in spotlighting future problems in accessing the documentation held in other Authorities as well as highlighting the variation in record keeping (Table 2). However, files established enforcement action was not a feasible approach to try and illuminate reasons for additional resource use. Nonetheless, the data from the questionnaires (Table 1) not only proved that resource overruns were more than a local problem, but was reinforced by the opinions of the regulators who recognised this was a critical issue and one worthy of future investigation to provide satisfactory solutions.

In contrast to the qualitative data assembled in phase one, one of the aims of the second part of the preliminary inquiry was to establish if resource overruns in personal practice were more than a localised issue because an intuition that it was widespread could not be empirically verified due to the paucity of literature on the subject. The quantitative data were gathered at premises of three Building Control units. The Questionnaires were handed out to the individual Building Control Officers during the researcher's visits to their offices whilst the archival retrieval process was in progress. There was unanimous agreement that domestic extensions caused both most of the non-compliance and resource loss problems. There was a high level of understanding that they require the most supervision in relation to resources. On reflection, this question may have been misconstrued by a minority of respondents considering resource use for larger projects of greater extent, rather than answering the question on a pound for pound

basis. For the researcher, this highlighted the dangers of possible ambiguity in the questioning procedures and a lesson taken on board in framing future questions.

Table 1: Questionnaire.

Questionnaire of twenty-five Building Control Surveyors	L/A A	L/A B	L/A C	TOTAL
Where do the majority of problems concerning non-compliance with Building Regulations occur? In domestic extension projects, volume house building or in other types of construction? ANS. DOMESTIC EXTENSIONS	100%	100%	100%	100%
Pound for Pound which requires the most resources in time and supervision, commercial work, volume house building or domestic extension or other types of construction? ANS. DOMESTIC EXTENSIONS	84%	88%	72%	82%
Which type of project is the construction cost likely to relate negatively to the time Building Control Surveyors spend in supervision? Volume house building, domestic extensions, commercial work or other types of project? ANS. DOMESTIC EXTENSIONS	100%	100%	100%	100%

The greatest amount of the research time in phase two was archive retrieval which took a period of some days to establish and calculate. Departmental records over a ten year period concerning the number of Building Regulations applications and the numbers of enforcement notices (Building Act 1984, s.36) served by each Authority for contraventions of the building codes were tallied. To determine the proportion of those figures that were specifically domestic extensions entailed laboriously checking each project file to see what category of work had been undertaken. The records for the number of projects referred back to the Local Authority from Approved Inspectors were scrutinised which proved to be an easier task due to the low number of referrals.

Table 2: Archive Figures

TABLE 2	L/A A	L/AB	L/A C	TOTAL
Total Building Regulations applications received from 1 st Jan 2000- 31 st Dec 2009	9848	8622	5760	24230
Number of Sec.36 notices under Building Act 1984 served 1 st Jan 2000- 31 st Dec 2009	91	2	0	93
Number of Sec36 notices under Building Act 1984 served that were domestic extensions from 1 st Jan 2000- 31 st Dec 2009	45	1	0	46
Number of projects referred back to the Local Authority for enforcement by Approved Inspectors	1	1	0	2

Summary

On reflection, a number of criticisms and issues emerged. In phase one; the researcher was embedded in the actual case being investigated. No actual formal interviews were conducted with the Home Owner, Builder, or Designer as there had been a high degree of interaction previously. The related opinions and attitudes of the actors involved were those formed by the researcher negotiating with the participants both on site and during informal exchanges. Neither were any notes taken concerning participant observation. These omissions were regarded as failings in searching out root causes of additional resource allocation problems which would have further enriched the depth of data accumulation. Because the case study had previously known contravention problems consequently, it was already pre-disposed to unprogrammed site inspections, additional office work and thus extra financial resource allocations to the Building Control unit. The case was nominated from the researcher's own Local Authority district and was not a random selection. The project was an extreme example of resource overrun from which it was hoped might lead to the discovery of a multiplicity of influences as to why these phenomena occur.

Phase two confirmed the extent of resource overruns was, at least, countywide and supported the proposition 'this was not just a localised problem.' The aspiration set out in objective 1 (1.4) was achieved and how much wider the problem extends was investigated at a regional level in the case study implementation phase Chapter 5. The result confirmed the assumption of the advantage to continue forward and carry out further research into economic resource problems in domestic extension at a regional level. With regard to the questionnaires (Table 1) on reflection further questions could have been included, as there was sufficient time. Inquiring relating to the complexity of domestic extension or comparison with major projects would have help refine the case study implementation phase. The extent of contraventions of the Building Regulations in domestic extensions was explored by investigating Authorities' legal enforcement procedures (Table2). However, by looking only at *contravention notices*, the

impracticality of any meaningful comparison of the data soon became apparent. This was due to the inherent discrepancies and variance in different Authorities' procedures. Contraventions of the codes are ubiquitous but in the majority of cases are resolved as the project continues without recourse to legal action. This was confirmed in the first phase which demonstrated the researcher's misconception of this phenomenon by only observing a project which had been served with a contravention notice. Mismatch of resources does not appear to be a problem specific to just a non-compliant project which has reached the stage of enforcement proceedings. The resulting data also highlighted the problems and divergences in administering Authorities' macro-record keeping. For example, one department served a section 36. Building Act 1984 notice for every single contravention on any project. Another issued the same type of notice but only one per project but listing all the contraventions. Both units recharge their Authorities' finance departments for enforcement action and thus helped save their own units' financial resources. Often the section 36 notice Building Act 1984 is used purely as a means of hurrying up rectification procedures for non-compliance issues, whilst one Authority never initiated any of this type of action what so ever. The impossibility of enumerating the data or producing mathematical results due to these varying approaches produced a negative outcome because of the impracticability of finding any relationships or patterns amongst the variables. The provision in the study of collecting data only from Building Control Officers (regulators) proved the need for expansion of participant sources to include (regulatees) namely Builders, Homeowners, and Designers.

It was apparent at the conclusion of the inquiry that in future research, and in accordance the proposals outlined in the methodology chapter it would be expedient to review individual project files to discover if they manifested evidence of economic resource overruns. It appeared that the majority of the extra resource use is potentially due to problems encountered during project construction on site rather than in office administration time during the

application and plan checking stage. By moving further from a quantitative approach to a more qualitative one, it was anticipated that a fuller picture and one of greater accuracy could be built, which would lead to more significant and richer results. The data concerning projects referred back to the Local Authority for enforcement proceedings by Approved Inspectors were also collected; note that the private sector has no legal enforcement powers (Communities and Local Government, 1985). The reason for this action was to help verify if enforcement issues were specific to Local Authority or mutual to both the public and private sectors. Due to the insignificant number of referrals and practically for time management reasons it was decided not to proceed further with this specific issue and concentrate research purely on Local Authority Building Control.

In consideration of the above-mentioned points, the mistakes encountered and problems found, it became apparent that multiple case studies, already decided upon in the methodological section, was a rational choice upon which to form the main research programme and the most productive way forward being effective in capturing rich information a view supported by Barrett and Sutrisna (2009). It fits the how and why research question, does not require control over behavioural circumstances but does focus on contemporary events and provides the opportunity to question the real actors involved in constructing domestic extensions. Case studies have frequently been used as a research tool (Yin 2009) and whilst somewhat similar to the survey strategy applied by Building Regulations Advisory Committee (2007), which too focused on contemporary events, it does not require control over behavioural experiences. The great advantage of the case study is that unlike the survey it permits the why form of research question to be proposed. The researchers aim was to endeavour to interpret the data in its cultural and social context even though there was already practitioner understanding and knowledge of the problem areas both tacitly and through the literature review. It was considered imperative to permit ideas to formulate and develop in this direction rather than stay attached to a subconscious hypothesis.

5.0 CASE STUDY IMPLEMENTATION PHASE

5.1 Introduction

The options for selecting the Local Authorities where the case studies were to be researched has been set out in the methodology chapter 3.4. These establishments comprised of a very small rural district which is a two-tier authority and is subordinate to the county council, a city administration that is the county capital, and a borough council which is a unitary Authority. Other Building Control bodies included an independently controlled voluntary consortium consisting of three Local Authorities working in combination and another where six district councils' Building Control function has been merged into a single countywide department. The population densities and local economy variations were also taken into account. They ranged from fifty thousand to around one million persons, and the diversity of each local economy income sources extends across a spectrum of agricultural, tourism, commercial/administration, and industrial enterprises.

Table 3: Type of Local Authority

District	Location	Size	Population	Entity	Economy	Building Control
1	City	Medium	125,000	Unitary Authority	University, Commerce & Administration.	Separate Department
2	Rural	Very Small	35,000	Rural District	Agriculture & Fishing	Separate Department
3	Town	Large	180,000	Unitary Authority	Leisure & Tourism	Separate Department
4	Borough	Large	140,000	Borough	Commercial, Industry	Combined with Planning Department
5	County Wide	Very Large	532,000	County	Mining, Tourism, Fishing, Agriculture & Light Industry	Six Districts Combined
6	Conglomeration	Large	260,000	Three District Councils	Industry, Commercial & Retail	Consortium

After the initial selection and appointment procedures had been completed each case project was approached in a similar manner. Interviews were conducted over a period of five months; the questions were semi-structured which provided opportunities to probe deeper into the assertions of the interviewees. The researcher was conscious that respondents' assumptions and claims should not go uncontested as only on these occasions can their experiences be constructed or reconstructed. At times, the interviews proved challenging to some of the actors taking part because the researcher sometimes took a journalistic and probing approach by requesting specific examples to support some of the preconceptions. The interviewees were not offended by this attitude as it permitted other views and opinions to be

discussed which in turn aided the research programme through triangulating of some of the respondents claims with the body of literature. This section of the research was the occasion when actors' experiences, knowledge, and interaction, based on their ontological position, proved to be significant constituents of social reality which could be investigated. The interviews took place with four categories of participants, those involved in the conception, design, regulatory, and construction processes of domestic extensions.

Home Owners, each with their individual peculiarities and specifications who first had the original notions and ideas about extending and enlarging their residences.

The Designers who consolidated the Home Owners' images and themes with their own design details and knowledge and who submitted the Building Regulations application to the Local Authority.

The Builders, who quoted and won the contract for the construction of the extension, or alternatively were awarded it on the recommendation of a third party,

The Building Control Officers, who checked the applications, plans, specifications, and undertook the site inspections.

The main house and extension of each project were visited, and notes were written up concerning the structural surveys personally undertaken of completed works. The Home Owners were the first to be interviewed and their personal documentation examined. Interviews were subsequently conducted with the Designers and the Builders engaged in each project. Finally, an interview was transacted with the Building Control Officers or the managers responsible for each project in their respective offices and the files and documentation appertaining to the applicable extension was scrutinised.

On the basis of the findings of the preliminary study the design of the main project was further refined in respect of procedures and data collection but remained within the set methodological framework. For example, the gathering of the primary data from Local Authority Planning applications online did not occur in one district as there was no public internet access to their records. This resulted in searching the Planning notices in the local press at the public library, a time consuming and disheartening operation taking in many days of travelling and note-taking. On-line access was not always straight forward as occasionally the registers were set out in yearly dating order by individual parish rather than covering the entire district. To obtain sufficient cases for investigation but primarily to distinguish domestic extensions from other types of application the exploration of the Planning registers averaged one hundred and fifty application searches per district. A list of names and addresses of the Home Owners of the domestic extensions was compiled for the entire year, and they were written to requesting their participation in the research programme (Appendix 2). There were fourteen domestic extensions in the smallest district and fifty-four in the largest district, unfortunately; the response rate was non-existent. To maintain momentum, it was decided to try and contact Home Owners directly as they were the key factor to facilitate commencement of the programme. Due to the travel distances involved and the probabilities of occupiers not being at home, personal visiting was discounted and telephone contact was considered the most efficient and least time-consuming method of liaison. A search for the phone numbers of the Home Owners, the Planning registers do not provide public details of private numbers, was achieved by use of internet directories. The subscribers of the telephone numbers that were traceable, some were unregistered or ex-directory, were contacted and verbally requested to engage in the research. Once personal contact had been established the acceptance rate to participate was high. In four of the districts, except for those who had not completed or even had yet to commence construction, the first Home Owners called agreed to be interviewed. Subsequent face to face contact

took place during working days and weekends and within the period of 8 am to 9 pm and lasted around two hours excluding the survey and documentation examination time.

At the completion of the interviews, Home Owners were requested to verify that the Designer that made the Planning application was the same person who made the Building Regulations' application. Where this was not the case, the Home Owners were requested to provide details concerning the new Designers engaged. All Designers and Builders contacted agreed to be interviewed and were often interested and enthusiastic about the study. If a refusal had occurred, then that case study would have been abandoned and an alternative project found within the same district. Interviews took place with all the Designers in their practice offices during normal business hours. Interviews with the Builders on one occasion took place in their office premises: the rest occurred either on the site where they were currently working or during the evening in their own homes.

All the domestic extension projects were granted planning permission in 2010; in every case, Full Plans applications to the relevant Local Authority Building Control units were submitted and subsequently received approval. Construction works were undertaken in the years 2011 to 2012 and inspected by the local area Building Control Officer; each project received a completion certificate stating that works had been carried out in compliance with the substantive requirements of the relevant building codes. The construction costs for the projects varied between the lowest at £25,000 to approximately £50,000 for the most expensive. These costings fell within the parameters for standard fee charges for domestic extensions which were based purely on the category of use (Figure 1).

Various issues that could have influenced or have specific consequences on potential site problems such as the age of the structures or their positioning were deliberated and reflected upon. It was considered imperative that this multi-case design followed replication logic and not sampling logic so that it

would serve in a manner similar to a multi-experiment (Yin, 2009, p.59). For example, in ensuring that there were no differentiating externalities such as boundary questions which may occur for Building Regulations purposes regarding issues such as structure, sound, and fire spread. Another possible externality was Building Control Officers may sometimes become involved ex-parte in party wall disputes between Home Owners. Other potential complications that could influence achieving replication logic were access difficulties. Some cases within the study had this type of problem for the Builders as well as material deliveries but none concerned legal neighbourly disputes or Building Regulation issues, therefore; no adverse influences were discovered.

None of the domestic extensions were enlargements to apartments; this situation rarely occurs due to, physical, leasing, and real estate restrictions. The study projects included detached and semi-detached houses but were deficient in terraced type house extensions. This did not present a dilemma regarding replication because issues of common boundaries, shared structural elements, and drainage are also relevant in semi-detached properties. Boundary and shared service complications with adjoining properties were not factored into the research specifically; they were regarded as ancillary issues, having no influence on the theoretical/literal replication logic outcome.

The dwellings where the extensions were constructed were built during the period from 1925 to 1980. No historic houses or listed buildings were encountered; the properties were typical of the majority of housing stock found within the region and no unorthodox construction methods or materials were found. The similar conditions and phenomena manifest in each of the multiple case studies meant the substantial variables were the participants involved and the individual designs. However, any true sampling logic application to case studies would involve too many cases to permit any statistical consideration of the variables. The decision for the selection of six cases rests on a discretionary and judgemental choice outlined by Yin

(2009, p. 53) expecting a pattern of results to emerge so as to verify the replication by either similar predicted results (literal replication) or contradictory results for predictable reasons (theoretical replication).

The strategy of speaking to the Building Control Officer responsible for the respective projects was modified from that stipulated in the original methodology. The interviews could not always be conducted with the Surveyor who inspected the works and checked the plans. In three out of the six cases the head of the department wished to be involved in the interview process and discussions. This proved a mixed asset whilst the practical on-site details could be extracted from the case files, the personal recollection of the works and interactions by the area Surveyors could not. A much wider perspective of the departmental operations and overviews was derived from the managers and this compensated for their lack of first-hand knowledge about individual cases. This aided the later interpretation of the data in a cultural context (Grix, 2004) and but truthfully only helped the researcher steer away marginally from any preconceived categories or codes.

Local Authorities' archival records specific to Building Control were scrutinised. These mainly comprised of organisational records such as project files, budget information and diverse maps and charts giving geological and geographical data. No formal direct observations were undertaken or developed as part of the observational protocol. Participant observation was limited to more informal exploration through the interviews and field visits at the time the data was being gathered. In contrast to the preliminary study, the exploration did not have any action research orientation because the researcher did not hold any participatory role, thus potential concerns about bias and jeopardizing credibility were automatically avoided. The limited volume of physical evidence, which according to Yin (2009) has less potential relevance in most kinds of case studies, has been briefly summarised in the structural survey sections.

The interview process had two basic functions, firstly to establish the views of the participants involved. The subject matter was focused on the processes and mechanisms engaged from initial conception to completion of the undertakings and explored the elements that might occasion additional economic resource use for Local Authority Building Control bodies. Secondly, an opportunity was provided to discuss opinions and views concerning the Building Control system in general. The rationale for this procedure was to seize an occasion where insights and ideas could be explored which might lead to the provision of improvements in the service and an enhanced understanding of the independent dynamics that shape eventual outcomes. Topics for deliberation focused on the participants' relationship with the inspectorate both at a personal and a corporate level. Discussion flowed into areas regarding ways and means to improve the service provision both from a clients' and Building Control Officers' perspectives. Value for money, charges for the service, extra expenditure, refunds, and alternative fee scales were also broached. Other issues raised concerned access to information, perceptions regarding the Building Regulations, and alternative approaches to building codes and regulations.

The method that the field notes are set out below replicates the logic of the research approach undertaken in each case. It commences with a description and details of the house type leading on to a brief commentary about the actual extension. Explanation regarding external elements, then a following of the mechanisms of the application process of the Planning and Building Control departments of the Local Authorities. Next, there is a narrative regarding the Designers and Builders who were involved in each project. Subsequently an outline of onsite problems and then an account of the construction phase of the project. Finally, the computations of the financial resource outcome after each project's completion.

5.2 Case study in District 1

House Type A 1950s built detached house about one mile from the centre of the city. The external walls were constructed with local brickwork and some wood shingles under a pitched roof with clay tiles. uPVC window and door frames fitted to all elevations.

Extension A single storey extension the full width of the existing house, twelve metres long built at the rear of the property. External walls match the current building with a mono pitch roof bearing on the existing rear wall of the house the extension wall. The new construction consisted of a large kitchen/diner with alterations to the original kitchen and dining room areas to permit the conversion into additional living space.

Externalities There were no undue gradients to the rear garden or large trees. Access was unrestricted via a side pathway. Construction work was easily undertaken to the external flanking walls as there was enough working room to the boundary fences.

Planning Drawings were submitted to the Local Authority for Planning Permission, and a considerable number of objections were received from adjoining neighbours. The plans were resubmitted with amendments to redesign part of the existing front elevation of the house and to reduce the overall footprint of the extension which met the objections of the residents of the adjoining properties. The extra drawings and the additional discussions the Designer had with the Planning Department entailed the Home Owner in considerable additional costs and fees. Plans were eventually approved subject to conditions to ensure the extension was in keeping with the original property and some adjustments and modifications to the front elevation of the existing house.

Building Control (Application Phase) The Department was part of a city-wide Local Authority with a population approximately of one hundred and twenty-five thousand. The submitted plans and specifications were approved

by the Local Authority Building Control unit without any conditions. The plans were received and dealt with in less than the statutory time limit of eight weeks.

Designer The Designers were recommended by friends of the Home Owners. They were a well known and respected practice consisting of three partners. They charged the full recommended professional fees for their services. There were disputes with the neighbours regarding boundaries and the size of the extension. The Designers had to redraw and amend their drawings on a number of occasions to obtain the relevant Planning consents. The Home Owners were perturbed at the length of time that this took and the subsequent addition to the fees charged. When Planning Permission was eventually granted a Building Regulations application was submitted. This was passed without problems, but the clients stated that this delayed the start of the project by more than a month. The Building Regulations approval was granted within less than two weeks subsequent to submission. The delay in construction commencement was therefore either due to the Designer being late in submitting the Building Regulations application or the contractor was overdue in starting construction.

Builders The Builders were recommended by friends of the Home Owner's but other companies were asked to quote, the company won the tender competitively on cost. The Builders were an established firm who had been operating for two generations on the outskirts of the city and employed about thirty operatives. This particular project was undertaken by the small works unit of the company.

Problems that occurred resulting in additional resource allocation by Building Control Four main events occurred which necessitated the Building Control Officer undertaking sixteen inspection visits instead of the five envisaged and programmed.

(a) Internal wall (Designer responsibility) The wall between the existing dining room and the old kitchen was detailed on the drawing as load bearing. This wall was supposed to take the dead and live loadings of part of the new roof structure and was approved by Building Control as it was itemized on the specifications as adequate for accepting the newly imposed loads. This information was incorrect and was an assumption on the part of the Designers. It transpired this wall was constructed originally when the house was first built but only as a partition between rooms and built off of the existing ground floor slab. Demolition of this wall was required, and then cutting through the oversite concrete, excavating new foundations, and constructing a new load bearing wall. In addition, to the Structural Engineer's calculations for the wall, further details were required for some of the supporting roof beams to meet the regulations concerning structural safety (Approved Document part A).

(b) Roof (Designer responsibility) The survey drawing indicated the window cills of the first floor of the house set at a higher position than they were in the existing rear wall. The required pitch for the extension roof could not be achieved and the angle for the roof covering would be too shallow to permit conformity with the building code for resistance to moisture (Approved Document part C). A reduction in the depth of rafter dimensions was proposed as a solution allowing maintenance of the correct angle of slope whilst still preserving the internal storey height as indicated on the plans. Further, Structural Engineer's calculations were then required to facilitate this change in spacing and dimensions of the rafters and ceiling joists in accordance with structural safety (Approved Document part A).

(c) Timber frames (Home Owner responsibility) Wooden external doors and window frames were fitted as per the drawings. The Home Owner wanted uPVC frames throughout, but the Planning Department refused to permit them. The Designer specified timber frames and detailed them on the drawings to accord with the Planning requirements. After the wood frames and doors had been installed they were then taken out and replaced by

uPVC doors and frames. This was classed as permitted development under Planning legislation and something the Planning Department had no powers to prevent. However, the change in the material usage of the frames and doors necessitated a further application for Building Regulation for the purposes of compliance with the thermal insulation codes (Approved Document part L) and safety glazing (Approved Document part N). It should be noted the Designer could have informed the Planning Department that this permitted development could be legally carried out after completion of the project and challenged their decision concerning the use of uPVC. This would have saved the Home Owner the cost of the additional labour and extra materials as well as the supplementary Building Regulations fee.

(d) Ground conditions (Unforeseen) The formation levels of the foundations detailed on the drawings were incorrect. Due to the low ground bearing capacity of the soil, deeper excavations were required to reach a suitable stratum where the soil conditions were such that the imposed loads of the structure could be accepted. It could be argued that the Designer should have taken soil samples to establish the ground bearing capacity on which the foundations were to be formed. This would be a standard procedure for major projects but would have caused additional preliminary expenses and would be an unusual practice in a project of this size.

Building Control (Construction phase) The extension was completed behind schedule due to the extra works involved. A completion certificate was provided by Building Control confirming that the substantive requirements of the Building Regulations had been met.

Eleven inspections above the programmed number originally envisaged were carried out. Three of these were cold call visits by the inspector because he was in the area. One was for a final completion inspection for which the Builders were not yet ready. The second and third were progress inspections to determine the current situation as the Building Control Officer had not heard from the Builders for a while. The other six were due to re-

inspection of work because of the problems mentioned above. The re-inspection for works encountered on site is set out below.

1. (Two inspections), the foundations were dug to the depth defined by the specifications; the Building Control Officer required the contractors to excavate deeper and reach adequate ground bearing strata. He returned to check the new excavation, but the ground bearing capacity was still unacceptable, so he came back again when the foundation trenches were dug to a deeper depth and the soil conditions were acceptable.

2. (Three inspections) the Building Control Officer had to inspect the foundations of the new load bearing internal wall. He was then required to return to inspect the damp proof membrane, the compaction of the hardcore, and the correct depth of the new concrete to the oversite which had to be replaced due to the digging of the new foundations. He inspected again to ensure the new wall was correctly bonded into the existing structure and also for the insertion of the damp proof course to conform with resistance to moisture Regulations (Approved Document part C).

3. (One inspection) to check the new roof members and the bearing onto the reconstructed wall mentioned in 2 above.

4. Office time was used in checking the calculations for the revised roof members and new wall.

5. The extra inspection costs required checking the removal of the timber doors and windows frames and the installation of new uPVC frames came from the fees of an additional and separate application for this specific set of works.

Building Control Financial resource allocation outcome:

Total fees charged by Building Control £505.

Plan checking and administration component £170.

Site inspection component £335.

Programmed site inspection rate £68.

Estimated total cost of inspections (16) £1072.

Estimated loss £1072-£335 = £737.

The Building Control Department failed to make use of the legal facility to recharge for extra works. It was the unit manager's decision alone not to exercise that right. His reasoning was that as this was a comparatively new procedure and there were concerns about litigation regarding fault allocation and it was better to sustain the deficit internally. Note also that an extra inspection was undertaken for the uPVC door and window frames, the separate Building Regulations application for this feature has not been included in the financial resource allocation outcome.

5.3 Case Study in District 2



Figure 6: Plans of project in District 2

House Type A 1920s detached bungalow set in a rural location overlooking a valley towards the sea and wooded hills. Part brick and rendered walls with asbestos tiles on a pitched roof.

Extension The extension was located at the rear of the property, partly flat roofed and partly pitched with exposed king post frame trusses allowing for an internal ceiling of up to four meters at the ridge line. The external walls consisted of storey height oak cladding. The extension composed of a large kitchen/diner, utility room, and en-suite bathroom with the master bedroom. Two Designers were involved with the project; the first obtained the Planning Permission, the second the Building Regulations approval.

Externalities The rear access was by a dirt track. The ground at the rear rose steeply so large quantities of rock had to be excavated and cut back and the spoil transported off-site for disposal. Access for materials and spoil removal was a problem due to the steep gradient of the track to the property and its poor surface condition.

Planning Planning Permission was granted after some lengthy negotiations with the local Planning Department who wished for a change in specification

to oak cladding to the external elevations rather than the original proposal of constructing the walls in part brickwork and render to match the existing. This condition was insisted on as the Planners required the extension to blend in with the woodland setting. The cost of the oak cladding contributed considerably to the expense of the project, nor was it thought by the Home Owner in keeping with the existing premises.

Building Control (Application phase) The Local Authority was a small rural council covering a large geographical area with a population of about 35,000 persons. The local office was about twelve miles away from the project site. The application was received and approved within the statutory time limits with no intractable problems.

Designers A Designer was engaged who only obtained the Planning Permission for the Home Owner. He was a chartered architect working in a practice consisting of four other persons based in an office about fifty miles from the project. The Home Owner was unaware that the Designer had only charged for the Planning application work rather than for all statutory consents. To undertake the Building Control application phase, he was requested to pay a separate charge to the Local Authority plus an additional fee to the Designer. The Home Owner already regarded the architects' charges as excessive, so he engaged a second Designer at one-third of the cost. The second Designer was a sole practitioner, and he obtained the relevant Building Control approval; there was some time lost because of this change which did not perturb the Home Owner as the project commencement date was not urgent.

Builder The Builders were known to the Home Owner as they had already carried out work for him at his previous home. It was a single man operation that had been established locally for over twenty years and consisted of four operatives and the principal.

Problems that occurred resulting in additional resource allocation by Building control No problems took place on site that caused Building Control to conduct any additional sites visits; only those programmed for were undertaken.

Building Control (Construction phase) Local Authority Building Control site visits were all satisfactory any minor issues were resolved on site under the existing inspection regime. Five programmed inspections were carried out. There were four “other” problem areas which occurred after the commencement of works, none of which entailed extra resource allocation for Local Authority Building Control.

(e) Water (other) The storage tank for spring-fed drinking water was damaged, and a new supply was required. A new private water installation would have to be tested to ensure wholesomeness if it was not mains delivered. Building Regulations require a potable water supply regarding Sanitation, Hot Water Safety and Water Efficiency (Approved Document part G). Rather than rely on a spring fed system which may have been intermittent a pumped mains supply was brought in from a third of a mile away.

(f) Fittings (other) Internal doors were hung the wrong way round from that indicated on the drawing. This was not a contravention of the Building Regulations.

(g) Insulation (other) Omission of correct insulation. To conform to the regulations concerning conservation of fuel and power (Approved Document part L).

(h) Ventilation (other) Omission of the extract fan. To conform to the codes concerning ventilation (Approved Document part F).

The issues regarding the change and costs of the Designers did not cause any problems for Local Authority Building Control. The omission of the correct insulation and an extract fan by the Builders that occurred during the construction process were rectified after being pointed out by the Building

Control Officer during part of the routine site visit regime (the details were actually in the specification but not on the drawings).

Building Control Financial resource allocation outcome:

Total fees charged by Building Control £514.

Plan checking and administration component £171.

Site inspection component £343.

Programmed site inspection rate £68.

Estimated total costs of inspection (5) £343.

Estimated profit/loss zero.

This was a project that went exactly to programme as far as the Building Control body was concerned.

5.4 Case study in District 3

House type: A 1970's detached house, brick and stone external walls under a pitched roof with interlocking concrete tiles. The house was situated over two miles from the main centre of town in a small close.

Extension A single storey full-length kitchen extension approximately twelve metres long at the rear of the property which included a new patio, steps, and balustrading on made up ground. Walls and roof were to match the existing and large patio doors installed to take advantage of the view.

Externalities As the gradient of the rear garden was very steep, running downhill from the rear of the house, there was a requirement for deep foundations and a robust retaining wall combined with a large amount of backfill and associated landscaping. Access was awkward via a narrow side path, the front gate and boundary walls had to be demolished to permit passage for a mini digger and dumpers.

Planning The application for Planning Permission had to be resubmitted twice, necessitating in three separate fee charges for reasons that the Home

Owner was unclear about. The first Designer was subsequently dismissed because of the drawing details and the ensuing trouble with the Planning Authority. A second Designer was engaged and was the person who actually obtained the Planning Permission.

Building Control (Application phase) The Building Control District was a Unitary Authority with a population of one hundred and eighty-one thousand. Planning and Building Control were a single department within the Local Authority. The office was based about three miles from where the extension was built. The application for Building Regulations was submitted and approved quite straightforwardly.

Designer The first Designer was a sole practitioner who was subsequently dismissed by the Home Owner as he was slow in working. A second Designer, another single practitioner, who lived in the same area, was engaged. He was prompt and efficient in obtaining the relevant consents and approvals

Builders The Builders were recommended by neighbours four other quotes were obtained by the Home Owner but these particular Builders' quotation was the least expensive. The company consisted of a two man operation doing most of the construction work between them; they had been in business less than two years.

Problems that occurred resulting in additional resource allocation by Building Control: Two problems took place on site both due to design omissions.

(i) Dimensions (Designer responsibility) The Designer originally engaged made a mistake in the survey measurements. The existing building was three metres longer than the drawing showed; this made the new extension one third longer than actually shown on the drawing. The discrepancy was not noticed by the second Designer employed as he neglected to carry out a resurvey. The Builders overcame the measurement discrepancies when

they discovered the error and adjusted the labour and material prices accordingly in negotiation with the Home Owner.

(j) Foundations (Designer responsibility) There were serious concerns about the potential of undermining the existing foundations and their adequacy to accept the additional loadings from parts of the new extension. The drawings indicated a hypothetical formation level of the original footings which was not the actual case. The depth of the new works impacted on the existing structure's foundations requiring additional strengthening and support. This consisted of foundations and retaining walls to contain the extra backfill to the oversite. This was to meet the requirements of structural safety (Approved Document part A).

(k) The existing soakaways and drainage (Designers responsibility) were proved to be inadequate and could not accept the additional volume of rainwater as required for Drainage and waste disposal (Approved Document part H).

Building Control (Construction phase) The Builders undertook the extra works in the course of their routine daily programme. The additional length of the building and the works to the foundation and drainage added a significant amount to the overall cost of the project for the Home Owner.

Six inspections were carried out by Building Control.

1. The extra three metres in length of the structure due to the dimensional error in the original survey was dealt with by the Building Control Officer during his initial foundation inspection. He agreed all the necessary changes to achieve conformity with the Builder at that time.
2. At the first foundation inspection, the adequacy of the existing foundations was discussed and the construction of retaining walls and underpinning was agreed with the requirement for submission of structural calculations and details.

3. During the above inspection, the drainage problems were discussed, and remedial measures to overcome them were agreed.
4. An additional re-inspection was called for over and above programme to check the new foundations and retaining wall. The drainage and soak away inspection was undertaken during a programmed visit.
- 5 Office time had to be allowed to check the new Structural Engineers calculations and details for the foundations and retaining wall.

Building Control financial resource allocation outcome

Total fees charged by Building Control £590.

Plan checking and administration component £205.

Site inspection component £ 385.

Programmed site inspection rate £77.

Estimated total cost of inspection (6) £462.

Estimated loss £462-£385 = £77.

The Authority may have just covered the inspection fee. From the Building Control records and site notes, there was a prolonged first inspection. The remainder of the site visits appeared quite short, actual spent time on site was not recorded only the fact that there was a site inspection. Therefore, there was no accurate way of determining the true cost of each visit by the regulator.

5.5 Case study in District 4

House type A 1930s detached house with external brick walls and a pitched tiled roof. The property was sited approximately six metres above road level on the side of a hill near in a major town about two miles from the centre.

Extension The original proposal was for the extension was a small single storey utility room approximately four by two metres on the side of the property. The walls and roof were to be constructed of similar material as the house so as to match the existing.

Externalities The ground to the flanks of the house was reasonably level. However, the access to the front from the road was up about twenty steps. Access for machinery was impossible, and all materials, and spoil had to be moved by hand.

Planning Planning Permission was granted by the Local Authority; the Home Owner was dissatisfied with the size of the proposed extension and the Designer said he would resubmit an amendment to the drawing. This information was incorrect because as there was a public footpath adjacent to the rear garden and a full amended application had to be resubmitted. The resubmission entailed a wait of eight weeks for the decision plus the additional planning fee. The amended application was approved.

Building Control (Application phase) The Authority was a large borough council with a population around one hundred and forty thousand. The Planning and Building Control operated as a combined unit. The amended plans passed by the planning unit were submitted by the Designer to Building Control and approved. The application included Structural Engineers calculations as the Designer knew Building Control would require justification of the wind posts he had incorporated within the extension design.

Designer The Home Owner was discontented with the Designer who was a one-man practice because of the cost and delay of the Planning submission. The Home Owner was also upset at having to pay for Structural Engineers calculations. The Designer's suggestions concerning the design of the extension were challenged by the Home Owner, who felt that as he was the client, the Designer should implement what he requested. The Building Regulations application went through the relevant procedures and channels without difficulties all the problems that occurred at this phase concerned Planning issues.

Builder The Builder was recommended to the Home Owners by neighbours and comprised of a local firm with between eight and ten tradesmen. The company had been in operation for over twenty years and was located about four miles away from the site.

Problems that occurred resulting in additional resource allocation by Building Control In total there were four problems that influenced Building Control resource allocation during the construction of the extension. Through professional skill, potential problems were foreseen and overcome before they arose thus obviating the need for extra site visits.

(l) Drains (Designer responsibility) The existing drains ran close to the proposed wall of the new extensions. The Designer had not checked the depth of the current drainage system when undertaking his initial survey. The foundations of the new wall as proposed would have transmitted additional loads on to the existing drains. Formation levels of any proposed foundations are required to be below the invert levels of drains if any loading is likely to bear on them to meet the requirements of structural safety (Approved Document part A) and drainage and waste disposal (Approved Document part H). Therefore, the foundations had to be dug deeper than initially envisaged, which necessitated additional excavation; spoil removal, increased concrete and masonry costs, together with additional labour charges.

(m) Structure (Designer responsibility) The Builder thought that the design of the wind posts was over engineered and resulted in quite a large amount of fabrication costs. The Home Owner concurred, and the contractor agreed to a change in the structure after consultation with the Building Control Officer. Basically, these concerned the omitting the over engineered wind posts that the Structural Engineer had designed and substituting robust masonry piers.

(n) Ground floor (Designer responsibility) The depth of fill required to the oversite was greater than specified. This would have resulted in causing

excessive lateral pressure on the front wall of the extension because the angle of slope of the ground was considerably more than that shown on the drawings. This would have necessitated a strengthening of the foundation walls to make them structurally retaining in character together with the importation of a considerable quantity of backfill and associated consolidation works. A change from a structural oversite slab to a block and beam flooring system was proposed by the Builder and accepted as a solution by the Building Control officer thus conforming to structural safety requirements (Approved Document part A).

(o) A larger opening in the existing side wall of the house (Designer responsibility): A wider structural opening from the current building into the extension was necessary due to the positioning of the kitchen furniture arrangements. The Designer's floor plans did not coincide with his kitchen furniture layout resulting in a discrepancy of approximately one metre. Longer and more robust lintels were required to conform to structural safety requirements (Approved Document A).

Building Control (Construction phase) There were four inspections one less than programmed for. The Building Control Officer discussed the potential problems with the Builder. This case provided an excellent example of actors working together through foreseeing issues that might arise which have the ability to cause delays on the critical path.

1. On commencement of works on site, the Builder informed the Home Owner that he could reduce the quotation price for the project if he simplified the structural design, which the Home Owner agreed to do. These alterations were confirmed by the Building Control Officer at his first visit.
2. The Building Control Officer observed drainage inspection covers near the trench excavations. He requested the covers be raised so he could determine the invert levels of the drains around the dwelling and found them to be deeper than the proposed formation level of the new foundations. The Builder subsequently excavated the extra depth for the foundations once the

invert level of the existing drainage had been established. The inspector spent additional time on site agreeing on the foundation change, but this was during part of the routine inspection regime.

3. The change from a conventional ground floor oversite to a block and beam flooring system was agreed during the programmed foundation inspection.

4. A small amount of extra time was spent on site at the next visit agreeing on the type and size of lintels for the enlargement of the structural opening between the extension and existing house.

5. A substantial amount of the inspectorate's time was wasted in the office at the plan checking stage examining Structural Engineers calculations for the unnecessary wind posts, but this did not result in any loss.

Building Control Financial resource outcome

Total fees charge by building Control £633.

Plan checking and administration component £211

Site inspection component £422.

Programmed site inspection rate £84.

Estimated total cost of inspections (4) £336.

Estimated profit £422 - £336 = £86.

No loss occurred during the plan checking stage even though the structural calculations check proved subsequently to be unnecessary. One less site visit was undertaken than programmed. However, extra time was required at each visit for discussion, troubleshooting, and mutual problem solving to take place.

5.6 Case study in District 5

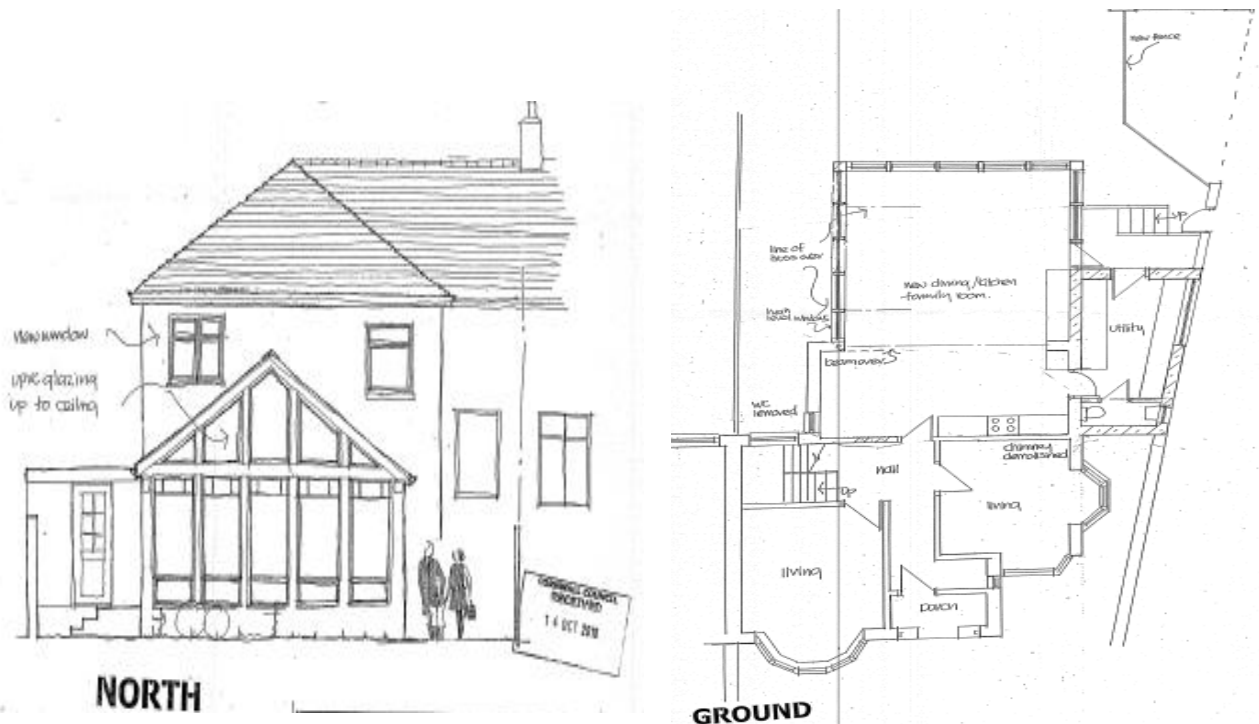


Figure 7: Plans and rear elevation of project District 5

House type A 1960s two-storey semi-detached house. Brick and rendered external walls with uPVC windows and door frames and a pitched roof over with interlocking concrete tiles. The property was located about one and a half miles from the town centre.

Extension A single storey rear extension six metres wide which included building over the side pathway. The external walls were to be rendered but with large areas of glazing. It consisted of a substantially sized family room with A-frame trusses open to the underside of the new pitched roof. Adjacent to the family room were a utility room and a shower room with the roof in this particular location changing from a pitched to a flat structure.

Externalities The ground level in the rear garden sloped away from the extension. This resulted in a requirement for a substantial amount of imported fill to make up the ground floor oversite to the extension. The rear

wall of the extension extended 1.5m from the boundary of the adjacent house to the boundary with the side access road.

Planning Drawings were submitted to the Local Authority for Planning Permission and passed subject to amendments. This was to provide obscure glazing to the window in the wall of the boundary with the adjoining property so that privacy could be maintained and the neighbouring garden would not be overlooked

Building Control (Application phase) The area branch office was approximately twenty-five miles away and part of a county-wide administration with a population of over half a million. Drawings for Building Control purposes had to be amended to compensate for the excessive glazing envisaged to conform to thermal requirements. The original quote from a green oak supplier for structural framing incorporating the A-frame roof trusses would have included Structural Engineer's calculations. The Home Owner requested a change in the design to glulam beams and uPVC framing. This necessitated him in the extra cost of the engaging a separate Structural Engineer to provide new calculations which were required by Building Control regarding structural stability.

Designer The Home Owner had engaged the Designers on a project for alterations to his shop a few years before hand. They were a chartered architect and a junior partner. The Home Owner already had an established working relationship with the Designers not only from previous projects but because his shop premises were right opposite their practice. There were no undue problems with either Building Control or Planning. As far as the Designers were concerned, there were just routine amendments to the application they submitted which were all approved in due course.

Builders The Builders were known to the Home Owners as they had undertaken work in the Home Owner's shop and his previous home which were both completed satisfactorily. They were a local company which

employed, depending on circumstances, in the region of eight to twelve personnel. They had been established over thirty years.

Problems that occurred resulting in additional resource allocation by Building Control Three problems took place on site, two due to the Designer and one due to the Home Owner.

(p) Insulation (Designer responsibility) An extra amount of insulation and under floor heating were required in the existing house as compensation for the heat loss that would occur in the new extension. The reason was the Building Control Officer discovered that the insulation components of the existing house had been detailed incorrectly and, therefore, the overall thermal calculations were wrong. The result was that computations for heat loss had to be recalculated to meet the requirements for the conservation of fuel and power (Approved Document part L).

(q) Fire protection (Designer responsibility) The measurements of the distances from the boundary to the extension of the property on the drawings were incorrect. The dimensions on the site were different and resulted in a boundary condition with potential risk of fire spread to the adjacent property. The Building Control Officer advised the Builder there would be a requirement for some method of fireproofing the glulam beams. This would have to be agreed so as to meet the regulations concerning external fire spread, fire safety. (Approved Document part B). The Builder informed the Home Owner, who sanctioned the Builder's proposals which were then agreed with the Building Control Officer.

(r) Structure (Home Owner responsibility) The Home Owner instigated a design alteration during construction by changing the type of roof covering material. The proposed roof covering was heavier than the original version specified which necessitated the strengthening of the roof to accept the additional loading. Extra supporting members were required to buttress the

roof and new calculations were needed to justify and confirm that the design change would conform with structural safety (Approved Document part A).

Building Control (Construction phase) The Builders carried out the extra works detailed above that were required by the Building Control Officer. Otherwise, all construction undertaken by the contractor was as per the original drawings and specifications. The five programmed inspections by Building Control covered this aspect of the works

However, a total of eight inspections were carried out by the Local Authority Building Control, three supplementary to the programmed five. These were for re-inspection of works to ensure conformity with the Building Regulations. In addition to extra office time spent checking the structural and thermal calculations.

1. An additional site visit to check that the supplementary insulation and additional heating works required in the original part of the house had been adequately installed.
2. An additional site visit by the inspector because he had to return to the project to check that the fireproofing had been carried out correctly to the structural glulam beams before the plastering commenced.
3. The altered roof structure necessitated an extra site visit so a re-inspection could take place to check the adequacy of the new members.
4. Time had to be factored in at the Building Control office for checking the newly revised roof structural calculations for adequacy and the revised thermal calculations

Building Control Financial resource allocation outcome:

Total fees charged by Building Control £423.

Plan checking and administration component £143.

Site inspection component £280.

Programmed site inspection rate £56.

Estimated total cost of inspections (8) £448.

Estimated loss £448 - £280 = £168.

This loss does not include the office time of the structural and thermal calculations checks undertaken by the Building Control Officer off site.

5.7 Case study in District 6



Figure 8: Front elevation of project in District 6

House type A 1930s detached house, with brick and rendered external walls. Upvc door and window frames and a plain tiled pitched roof. The house was situated about three-quarters of a mile from the town centre.

Extension The extension was built on the right side of the front elevation of the house as one looked at it from the road. It consisted of a large quadruple garage at street level, a master bedroom situated over the garage at a level midway between the ground and first floor of the existing property. A

conservatory was also constructed at the same time adjacent to the existing front entrance porch. The extension was linked to the main house in two separate areas; firstly, at the rear by an interconnecting internal staircase with a shower room on the half landing, secondly by stairs at the front by the conservatory connecting the master bedroom to the ground floor living room.

Externalities The floor level of the porch and conservatory had to be raised by approximately 1.4 metres to marry in with the existing ground floor. This was because the ground at the front of the house was lower than the ground at the rear. The rear garden sloped upwards from the back of the property but from the right side, it sloped downward and away from the house. Access was at the side where the extension was to be constructed and, therefore, all materials and spoil had to pass through the garage part of the extension. A public sewer ran through the site and had to be diverted which caused a three-month delay in commencement.

Planning The submission to the Planning Department was dealt with promptly there were no objections from neighbours or any other contentious issues.

Building Control (application phase) The department formed part of a consortium that covered three districts with a combined population of two hundred and sixty-five thousand. Drawings submitted to Building Control were passed in less than the statutory time limit with a proviso that there was a build over agreement entered into with the Water Authority regarding the public sewer. This agreement meant construction was not permitted to commence until the public sewer had been diverted. There was a delay in the sewer diversion works which prevented construction starting on the project extension. This was blamed on the Builders by the Home Owner for they had taken over a company that was registered for sewer diversions. As they had the same staff, premises, and equipment they believed the existing sewer works licence would automatically transfer to the new parent company, this was an incorrect assumption. It was a mixture of the Designer

not comprehending that a transfer had to be completed, the water company being bureaucratic and dilatory, and the Builder being unaware of the legal reality of the licence transfer from the subsidiary company. Building Control had no input regarding these issues.

Designer The Designers were engaged without prior recommendation or knowledge on the part of the Home Owner but on the advice of the local estate agent who had negotiated the purchase of the property for them. They were a firm of three architects and two associates plus support staff. Planning Permission and Building Regulations approval were dealt with speedily and there with no contentious issues. The build over agreement for the public sewer that traversed the premises was handled by the Designers and was acted on as soon as the position of the sewer was brought to their attention.

Builder The Home Owner was new to the area so he requested his Designer to provide a list of recommended contractors to price for the project. The Builders engaged won the tender on cost, provided references, and had a staff of about fifty. They were a new company that had taken over a local contractor who had been in operation for over forty years. They were based about five miles from the extension and had some local operatives undertaking the works.

Problems that occurred resulting in additional resource allocation by Building Control There were three problems on site but only one affected resource use for the Building Control department and was caused by incorrect information by the Designer.

(s) Roof (other) There was a major dispute about the roof to the conservatory. Details were initially for timber construction which proved to be dimensionally too large to install, so for practical reasons the structure was changed to steel. The steel fabricators and the subcontract window

installers went into a dispute over dimensional tolerances in the finished product, and the Builder was left to overcome the problem.

(t). Radon (other) A radon sump was constructed beneath the garage floor slab because it was specified by the Designer on the drawings. The Local Authority Building Control did not require a sump for radon gas to conform to the regulations regarding toxic substances (Approved Document part D) as any radon present would disperse adequately in a ventilated garage. However, they had no power to require its omission only suggest that its installation was an unnecessary additional cost.

(u) Foundations (Designer responsibility) Sloping ground and the direction of fall was not noted by the Designer on the drawings and this omission necessitated a change in the foundation design. To achieve level foundations construction, the excavation of the formation levels was required to be stepped in accordance with the regulations concerning structural safety (Approved Document part A).

Building Control (Construction phase) Local Authority Building Control inspection regime was unaffected by the issues concerning the radon sump, sewer works, or the conservatory roof structure during the inspector's routine site visits. The Building Control unit programmed one additional site inspection thus allowing for six visits instead of the routine five. However, they did undertake eight inspections, due to the sloping ground condition; this was two more than the technical break even point of six.

There were two foundations inspections carried out twice on the same day, and similar re-inspections the next day. However, there were actually only six callouts to the Building Control office. In practice, the area surveyor returned to site for the re-inspections on his way back to the office after the adjustment works to the foundation excavation had been completed each time.

Building Control Financial resource allocation outcome

Total fees charged by Building Control £ 690.

Plan checking and administration component £210.

Site inspection component £420.

Programmed site inspection rate (based on standard extension fees) £70.

Estimated total cost of inspections (8-2) £420.

Estimated loss £420 - £420 = £140.

It was fortunate the fees for this project were higher than normally charged for domestic extensions as the Designer had accidentally sent a cheque for a fee based on the actual cost of works rather than on category B work designated for domestic extensions (Figure 1). Hence, the reason for six inspections programmed. Fortunately, the two re-inspections for the foundations were undertaken the same day and the Building Control Officer re-inspected as he was returning to the office. Nonetheless, even when fees are based on construction cost, it appears there could still be overruns if extra site-visits have to be carried out.

5.8 Structural surveys

Structural surveys were undertaken in the six domestic extension construction projects by the researcher. These were pursued in two capacities one as a regulatory inspector to ensure conformity with the building codes and another as a Chartered Building Surveyor to confirm general workmanship, materials, and good practice. Some of the workmanship in a number of areas such as coursing and level of the brickwork were not to a high standard; some plaster work and timber finishes too were sometimes rather poor. These were mostly minor irregularities which could be corrected by the contractors and were mainly on projects where the final snagging process had not been carried out. None of the works had any major defects or structural problems. All the extensions conformed to the substantive requirements of the Building Regulations and had received completion certificates from the relevant Authorities. No additional issues or problems were discovered specifically attributable to

these surveys that could have had any influence on cost overruns by the controlling Authority.

5.9 Participant descriptions

Home Owners

District 1

The Home Owners were a professional couple who were enlarging their house to make additional room for their three children who were at primary school. The lady of the house was the one interviewed though her husband was at home. The interview took place on a Saturday as the couple were at work during the week and the wife was studying for a master's degree during the evenings. They had lived in the house about seven years.

District 2

The couple who owned the property had recently retired. They had owned an equestrian business which was now being run by their daughter who lived just up the lane from them. The interview took place in the extension with the husband who had some knowledge of the construction processes. They had lived in the bungalow for a good many years.

District 3

This was a couple who had recently retired and had sold their language school business in the same town as their present home. They were in the process of expanding their property so their children who had left home could visit more easily. They spent their time between their retirement property and the flat they owned in London. The Home Owner was acquainted with the processes of construction as he had extensive work carried out at his school premises. They had been in the property for three years, and the interview took place in their home with both of them present.

District 4

The Home Owners was an optician with his own practice, and his wife worked part time for him. They had two children of junior school age. A friendly and outgoing family who were interviewed in the kitchen just after teatime. They had been in the property about ten years

District 5

The Home Owner had a business in the same town. His wife worked for the company and was at work when the interview took place which was in the couple's home. They had building work done on their business premises previously and knew both the Architect and the Builder through professional associations. They had one grown-up son still living with them, but the rest of the family had left home. They had lived in the same house for over twenty years

District 6.

A couple who had retired to the South West region from the Home Counties and had been in the property a few months when they commenced work on the extension. They had bought the house for the sole purpose of extending it, so they had room for visitors and somewhere to store their boat. As they were new to the area, they had no previous contacts to help make any decisions on engaging a Builder or Designer. They relied on their estate agent for such advice at the time of purchase.

Designers

District 1.

The Designers were chartered surveyors operating in a three person practice. The practice was based a mile and a half's distance from the project. The offices were located in Georgian premises within a fashionable district of the city. The interviewee was a member of the RICS and had been professionally qualified for about fifteen years and was an associate within the partnership.

District 2

The first Designer had been dismissed; the practice was contacted and the responsible Designer was spoken to on the telephone. Due to the animosity between himself and the Home Owner he declined to be interviewed. The second Designer was a one-man architectural consultant practice who lived and operated less than a mile away from the project. He was a retired gentleman who had been in business for over forty years who worked from home undertaking the occasional commission basically to pay for his insurance and membership of CIAT. He had known the Home Owner socially for many years.

District 3

The first Designer was discharged, and the researcher was not provided with any details of his appointment or his name and address. The second Designer engaged was a one man practice operating from home as an architectural technician. He had been operating for over thirty years and at one time had engaged an assistant to help him in his work. He now operated on his own even though he had an extensive client base; having a customer who had a chain of establishments all over the country. He was not a member of any professional body. He submitted the drawings to the Planning department which were approved in addition to the Building Regulations application.

District 4

The Designer was a single architectural technician operating from his home about three miles from the project location. The interview took place in his house which served as an office. He had been undertaking design work for over twenty years preceded by time in an Architects office during his teens and early twenties. He was a member of CIAT. He only undertook small projects and was happy to keep just a sufficient workload to operate at a measured pace.

District 5

The Designers were a practice of chartered architects with two partners and two administration staff. The practice was based in office premises in the main business district of the same town in which the extension was built. Both architects were present at the interview one who had recently qualified and the other who had been in practice for more than twenty-five years. They were a well known and progressive business in the town and consequently most of their work was locally based. They had a reputation for innovative design and flair.

District 6

The Designers were Chartered Architects with four staff. Their office was about twenty miles away from the project based in a converted chandlery in a boat yard. Only the Architect, who designed the project, was interviewed. He was RIBA qualified and the eldest member of the practice but just worked three or four days a week. The partnership was involved mainly with larger projects, and domestic extensions were not an important part of their business. The interviewee carried out the less demanding projects in the practice even though he was the senior member of the team.

Builders

District 1

The interview took place in the offices of the contractor located on an industrial estate on the outskirts of the city. The interviewee was the contracts manager. He had many years experience in construction and had risen through the company over an extended period of time. However, the volume of work he dealt with meant he did not have as much day to day input on projects as he would like. This particular project had caused many problems, but he only became personally involved at a later stage. As this was a small works contract the site foreman undertook most of the decision making. The company had larger contracts which took precedence; it was

apparent this particular contract was considered inconsequential and was given low priority.

District 2

The interview was carried out in the room used as an office in the Builders house. He was a contractor who had served his apprenticeship forty years ago. He was a traditional tradesman who was proud of his work but could not be described as innovative or forward thinking. The operatives working for him were regarded as friends or co-workers rather than employees. He worked in the same area as he had grown up in and he and his family were well known locally.

District 3

The Builders were a two-man partnership, and the interview took place in the living room of one of the partners. Both were in their mid-twenties and had worked in the industry around ten years before setting up on their own. The business was not prospering, and they were working subcontract for other Builders when they did not have their own contracts. They were competent tradesmen but were finding difficulty in running a business with administration, pricing, advertising, taxes, and so forth. In addition, they did not possess a broad range of contracting expertise even within the limited field of domestic extensions. Neither did they at this stage in their careers have a full working knowledge of all the construction regulations, laws, and rules that might be expected of a small contracting enterprise.

District 4

The interview took place at a project the Builder was undertaking a few miles away from the extension described. The proprietor of the firm ran the company from an office in his home in the same town. He was a tradesman who also had his son working for him and had specialised in small works in the same area all his working life. He had been employed for other companies for about half of that time and set up on his own when he was about thirty-five years old. He had started as a one-man firm but was happy

to keep his company at its present capacity. The reason was that he knew his operatives personally and liked working with them. If the firm expanded any further he would have to spend most of his time pricing, ordering, negotiating and other administrative tasks. His wife carried out the wages and payment side of the business.

District 5

The interview was carried out with the site foreman in his home about a mile from the project. He was a director of the company and had worked for many years with the founder of the firm from a time when it was first started in the early nineteen eighties. The founder's son was also a director and was destined to take control of the enterprise when his father retired. The interviewee was in charge of the work on site and day to day operations whilst the founder and son undertook the management role. The maximum staff numbers were twelve and were all local residents.

District 6.

The manager for this project was interviewed on a construction site about sixty miles from the extension. He was an experienced and qualified site manager who usually worked on far larger projects. He was in his thirties and had not been with the company very long because it had only been formed a short while. Some of the operatives on site travelled quite some distance to work whilst others were based more locally. This was not a close knit team as was common on other extensions and the company was larger in comparison to most contractors on similar sized projects.

Building Control Officers

District1

The Building Control Officer interviewed was the manager of the department and nearing retirement. He had been in Building Control for nearly forty years and was a senior member of the profession both of the RICS and CABE and possessed a degree in fire safety. He had been in charge of the

city-wide Building Control unit for about twenty years and was well respected in the local construction community.

District 2

The interviewee was a Senior Building Control Officer, who had two other surveyors and an administrative assistant working under her. She was in charge of Building Control within a small district. There was a limited amount of major construction work in the area, so the range of projects to supervise was narrow. She was heavily involved with Local Authority Building Control membership organisation and had been qualified about ten years.

District 3

The participant was a highly motivated manager who had been in Building Control for over thirty years. He was running a very dynamic department and had many ideas for improving the service both at a local and national level. He was involved to some degree with the RICS but directed his energies into running a combined Building Control and Planning unit.

District 4

The Principal Building Control Officer with over twenty-five years experience working in a combined Building Control and Planning department. He was in charge of a staff of over forty persons but still kept his hand in by endeavouring to attempt some practical work each week through plan checking and site inspections. The reason for this approach was he aimed at interacting with his staff as much as practically possible. He was involved locally with the RICS.

District 5

The Building Control Officer was newly qualified and had started as a trainee about six years previously. He was in his mid-twenties and keen to further his career he was a member of CABE but hoped to eventually join the RICS. He was continuing his studies and professional development.

District 6

The interviewee was in the earlier to middle stages of his career hoping to become a Senior Building Control Officer. Qualified and a member of the RICS he had worked in Building Control about fifteen years. Although he wished to progress up through the consortium because of family commitments, he did not want to move away from the area to obtain promotion.

5.10 Summaries of questioning

Building Control Services

As the interviews progressed, it was possible to seek actors opinions on a range of issues. Opinions were sought about Building Control services, how they might be improved, and if they were value for money. Participants were asked if they thought the set fee scales were reasonable and if there should be a national fee scale. The regulatees were questioned about their relationships with the Building Control Officers, the Local Authority Building Control department, and the ease of obtaining information and contact. They were also requested to give their views on the following topics; the ease of obtaining information about the Building Regulations, their opinions of the Building Regulations, if they thought more information should be published, if there should be special regulations for domestic extensions, and if they aware of the right of Local Authority Building Control to charge extra fees for any additional work?

Regulations

Diverse authors (e.g. Imrie, 2007; Hemsley, 2003; Klettner, 2013; May, 2007; Mackenzie and Lucio, 2005) have made reference to difficulties in regulatory control regarding various types of regulations such as performance, self-regulation, and prescriptive codes. It was considered essential to discover if the character and makeup of the regulations had any effect on project outcomes and if so how and why. In addition, it was imperative to endeavour to ascertain the participants' observations and

opinions on this particular issue. They could be either true reflections of that produced in the literature, something contradictory, or views in between. The discussions focused on self-regulation, the differences between performance and prescriptive regulations, and system based regulations. Other topics covered were if regulations could be simplified or better explained and if they were rational in all cases.

Applications

The researcher wished to seek the comments of the persons involved in the projects concerning the application route taken to obtain Building Regulations approval. It was established at the commencement of the interview session which route the applicant had taken. None of the domestic extensions in the research programme were constructed under the Building Notice scheme. All six projects used the Full Plans approach, so it was interesting to discover why the alternative system had not been used and if this factor had linkage to outcomes and extra resource use.

Home Owners and Designers were questioned about this topic as they were the ones who made the decisions on which route to follow. They were asked directly why they used the full plans option and if they had heard of the Building Notice scheme. If they did not know the answers to the second question they were asked if they knew there are two different application routes. They were invited to provide an opinion on the Building Notice Scheme and Full Plans schemes. The opinions the Builders and Building Control Officers were sought regarding the merits and disadvantages of the two application routes.

Approved Inspectors

The questioning included all participants, but specific questions were put to particular groups. Those employed by Local Authority Building Control were asked how much and what percentage of their departments' work was done by Approved Inspectors. Home Owners and Builders were asked if they had ever heard of Approved Inspectors. Designers were quizzed if they chose

Approved Inspectors or have done so in the past. All interviewees were requested to express their views of Approved Inspectors, if they were a good thing, if they thought it beneficial to the industry and community having private Building Control?

From personal experience, the advent of Approved Inspectors has influenced the public sector's work practices and attitudes and has been documented on numerous occasions in professional journals (Clarkson 1998). It has also resulted in a loss of work for Local Authority Building Control especially for larger scale projects. One of the ancillary topics which the research hoped to shed some light on were about the causes of Local Authority losing work and if this varied from district to district. A primary objective of this subject issue appertained to lay participants to establish if they were aware of the existence of alternative Building Control mechanism and to confirm whether or not there was a universal appreciation of the existence of an alternative system. The factors that influenced the choice in selecting either public or private sector control when engaging an inspector was also regarded as important. The opinions of the interviewee were sought regarding Approved Inspectors' delivery of Building Control in the marketplace and if this was a beneficial measure for the community and industry.

Externalities

Some external agents and systems could influence the choice of using Local Authority Building Control. Examples of influencing factors might be through difficulties encountered with other departments within Local Authority. Authorities' policy on compulsory submission of applications electronically or aversion to bureaucratic entities could be further reasons. Questioning was directed to tease out other factors that might not be apparent to the researcher.

Relationships

The relationship and interaction between all participants involved in the construction of domestic extensions determine how well those projects might progress (Kadefors, 2004). It plays a critical role in who is engaged and by whom. How much these intercourses position the outcomes of additional resource allocation was considered an essential component of the data collection process. Particular attention at the interview stage focused on the reaction of participants in their responses regarding their thoughts and attitudes to co-actors. Questions to the Home Owners revolved around issues such as how they reached decisions on engaging and selecting the Designers and Builders and if they were recommended, also how the Building Control Body was chosen and by whom. Interviews with participants went into some depth; regarding their personal and professional relationships with the other actors they were involved with concerning their particular project. Interviewees were also questioned regarding standards of workmanship and the professional competence of the other parties.

Building Control functions

The opinions of Building Control Officers were requested about a number of key issues regarding operational activities. The organisational arrangements in larger units often mean the plan checking and site inspection functions are separated which could have a detrimental effect on continuity of outcomes and relationships on site. There may also be an optimum size for Building Control bodies to practice within, be it local, consortia, regional or, national. In addition, there are units which are multi-functional in that they incorporate the Local Authorities' Planning activity. Enquiry was made of other participants regarding these issues when they indicated they had an interest and/or knowledge concerning these matters.

5.11 Documentation

The documentation that was accessed was drawn from the following sources:

The personal records and paperwork concerning Home Owners' ideas for their extensions and the following engagement processes.

The plans and specifications produced by the Designers for the projects.

The Builders' contracts, bills of quantities and their own notes and records where applicable.

The Building Control units' administrative documents, files, site notes, and supporting administrative archival material.

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5.12 Archival Retrieval

The personal diaries and calendars of the Building Control Officers were perused, but these were not of particular relevance or use in collecting evidence. Material of any consequence was not revealed, in fact, most of the entries were appointment times and contact details. Quite a number of notes concerning case visits were not itemized, and only a date was entered and that the site had been inspected. Case Officers admitted that they took the project files with them on site visits and would jot down brief notes as the day's work proceeded. Therefore, personal records even in computerised form proved of little advantage in the progression of the evidence collection.

Additional archive material was sourced from the organizational records of the Local Authorities. Though not pertinent specifically to individual case study projects they did shed light on additional site visit, budgets, enforcement, and the institutional arrangements within the Authorities.

Archive records were kept by all Authorities concerning the number of Building Regulation applications submitted as initial notices by Approved Inspectors. The distribution of the work undertaken by private and public sector is set out in figure 9. The figure is not strictly accurate as there are

disparities between districts in their record keeping procedures. All Local Authority Building Control Departments keep an exact tally of the number of project applications submitted by the private sector. However, not all of them record the cost of the works whilst others fail to identify the number of individual units constructed for example on large volume housing sites. None the less these dissimilarities do not unduly alter the significance of the results presented in the table and provide a reasonable guide to the amount of work retained within the public domain.

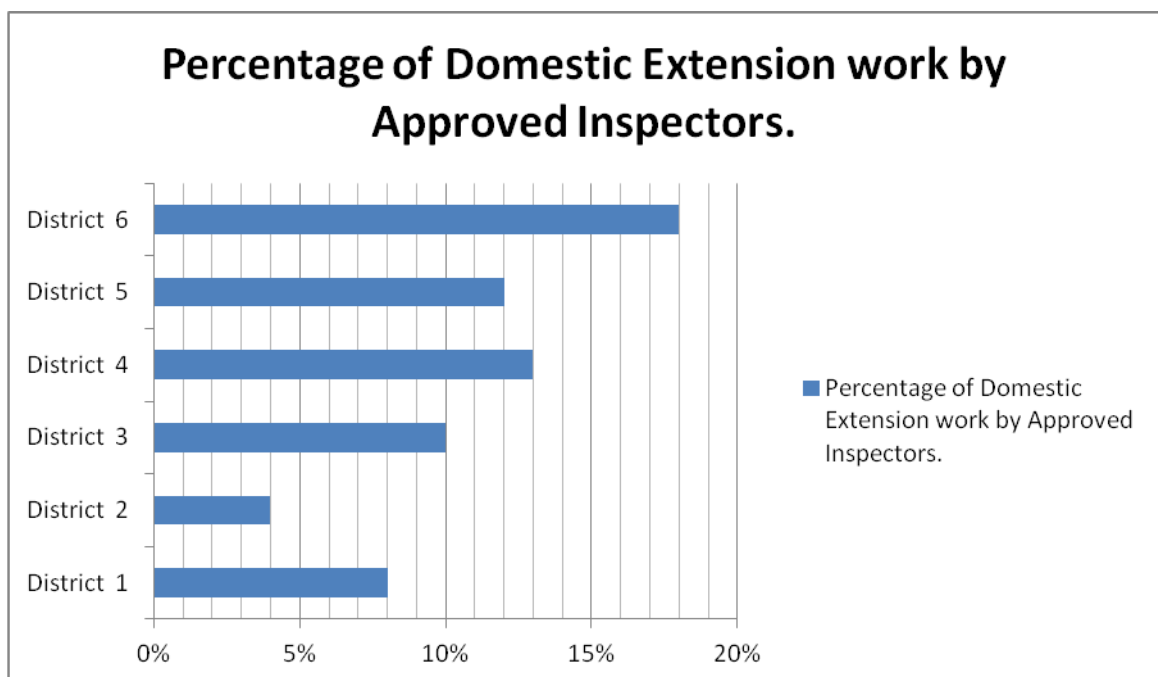


Figure 9: Approved Inspectors' share of construction work.

Archival records are accurate and consistent within all the Building Control departments involved in the case studies regarding applications. These are detailed either as submissions for the Full Plans approval system or the Building Notice scheme. Personal practitioner experience in the past has led to an awareness that sometimes recorded figures have been massaged to give an impression of higher workloads. This has been accomplished by refusing outright Full Plans submissions rather than allowing the Designer to amend the drawings or even permitting a conditional approval to be granted. Consequently, the modified drawing are submitted as a re-application, then

assigned a fresh file number and recorded as a new submission. No evidence was discovered of this practice having taken place within any of the Authorities studied in this research programme.

There was a paucity of archived enforcement records, mainly because so few of the Building Control bodies took any legal enforcement action. This did not necessarily denote a toleration of non-compliance with the building codes rather it highlighted a multifarious approach to this problem. Some departments threatened statutory action and this alone achieved results. Other bodies placed the contravention as a charge on the Land Register, which would be revealed on subsequent searches, making the sale of the property difficult in the future unless rectification procedures were enacted and the charge subsequently removed. Another mechanism to ensure regulatory compliance was for the area Building Control Officer to periodically visit and to chase up the rectification works. Withholding a completion certificate was another technique used which again could have an adverse effect on any future sale of the property. All the above actions require additional economic resource use to a greater or lesser extent and could result in a negative financial influence on the Building Control body. The methods used in accounting time and resource use were principally those recorded on the relevant project file together with copies of any ensuing paperwork. No distinct or separate documentation was kept in any departments regarding how these isolated enforcement and compliance achieving tasks were costed. The only method of collating how much economic resource allocation might have been spent above programmed works would have been to examine every individual project file out of the thousands stored in the archives.

Every Authority kept an account of how long it took to determine an application. They all achieved a hundred percent fulfilment of their target to settle all submissions within the statutory time limits of five or eight weeks (Building Act 1984). This was to be expected as the law permits an applicant to claim a reimbursement of fees if the application is not determined within

the statutory time limits and would also be deemed approved by default. There were no separate records kept about the time scales of determinations whether they were speedily dealt with from the moment of submission or if they sat on a Building Control Officer's desk for weeks before being checked. The only possible method of verifying the swiftness of the plan checking process would again be to analyse the thousands of archived project files individually. A calculation for the checking time could then be made by subtracting the actual determination date from the application date. No record was found of any Authority claiming additional fees for extra work as permitted under the recent legislation. On the other hand, there was no information about refunding fees under that legislation either (Building (Local Authority Charges) Regulations 2010, SI. 2010/404).

The researcher would have liked to have scrutinised the minutes and transcription of meetings between the heads of the Building Control departments and their executive superiors, councillors, and finance personnel. This might have provided an opportunity to gain some insight into how local fee scales were set and how financial arrangements were made to operate within the statutory guidelines of the overriding three yearly accounting objectives set by Government (Building (Local Authority Charges) Regulations 2010 SI 2010/404). The research also may have revealed the policy rules regarding reimbursement of fees or the charging of additional fees and if surplus fees were absorbed by an increase in departmental overhead charges and services. As these were all sensitive issues, access was either denied, or no one knew where the information was kept. Besides these constraints and time limitations, in reality, the analysis would be ancillary to the main investigation.

There are significant geological variations within the south-west region, and each Building Control Body keeps maps and charts and information peculiar to its own location. The specific data covers the structure of the earth's crust and the formation of the substrata. The range and diversity of the geological composition can also differ quite remarkably within Local Authority's district

boundaries. Obviously the greater the Local Authority's geographical area the increased likelihood of abnormal ground formations and circumstances within that district. The geology ranges from the Jurassic coast in Dorset and the Somerset levels in the east of the region to the high granite plateau of Cornwall in the west. Sand, grits, shale, peat, shrinkable clays limestones are examples of the diversity of ground conditions that are likely to be encountered. Ground heights shown on the contours of geographical maps were used to ascertain exposure conditions whilst watercourse mapping assisted in determining areas of likely flood plains.

Other records were required by Building Control Officers to aid in performing their function of ensuring compliance with the Building Regulations. The use of meteorological data regarding wind speeds, which impose differential live loadings on a structure, is an example. On checking the archival material, it transpired none of the case studies were in areas of substantial exposure for this phenomenon to influence the design proposals. Some of the extensions were built near the coast where the effects of erosion have to be considered however none had constructed close enough to the shoreline to warrant any precautionary investigation. The hazardous nature of the atmosphere due to high salt content had to be confirmed due to the location of some of the extensions. The archival records reveal that even construction that is not necessarily in close proximity to the sea can be attacked. Salt in the air causes aggressive environmental conditions which can cause corrosion to steel and other metal components within the extensions' structure necessitating the use of corrosion resistant components and materials. These were specified by the Designers on initial application, approved at the plan checking stage and did not constitute a variable between the projects.

Radiological protection data is available nationally, but radon protection measures were not necessary for any of the extensions researched. Local maps and other archival data are also valuable as they may reveal other hazards such as disused refuse sites which often sources of the production of methane gas. They also may indicate sites where there are deposits of

dangerous material that could produce adverse problems to foundations, drains and so forth. Particularly useful are past records of old mine workings especially pertinent in Cornwall with the prevalence historic tin mining but also quite extensive in Devon regarding silver and copper workings. Perhaps the most used archival resource is the service records for the utilities. In every case the Building Control Officers had examined these types of documents at the plan checking stage.

6.0 EMERGENT SECTORIAL MATERIAL AND ANALYSIS

6.1 Introduction

To improve the capabilities of Building Control practice and overcome the inefficiencies inherent in additional resource use, specifically in the field of domestic extensions, the research endeavoured to address the issues in a number of ways. Illumination of the genesis of this phenomenon was of paramount significance attempting to explicate resolution to the problem through the adoption of various mechanisms to find appropriate ways and means in overcoming the dilemma. The intelligence accumulated during the data collection stage was extensive but was the appropriate volume required to form a comprehensive analysis of the material. It permitted the magnitude and geographical extent of the problem to be identified and the discovery of the influencing factors that cause extra resource use. The analytical contents of the chapter are set out in sections under governance, social, and technical complications.

In addition to quantitative mechanisms a substantial part of the research question has been investigated by the adoption of qualitative techniques. The researcher was interested in discovering ways of evaluating, explaining and interpreting the social phenomena brought to light by the data collection.

The credibility of the rigour of the research depends on the internal validity of the investigation (Robson, 1993), which is part of the data analysis. One of the most dominant modes of analysis is pattern matching (Yin, 2009) but enhanced through other tactics such as explanation building, logic models, and addressing rival explanations. Line by line analysis was carried out for the process of open coding of the interviews but as Proverbs and Gameson (2008 p.103) state, 'the most obvious approach is to focus on the original objectives to help guide and determine the analysis'. That does not mean that case descriptions or rival explanations or theories were ignored.

The interviews provided an opportunity to explore other areas of interest and subject matter due to their open-ended nature. The researcher was aware that this could lead towards other avenues which might prove irrelevant. Though there were time restraints, it was worthwhile to let the respondents elaborate on other topics of concern to them. Further categories emerged from individual cases which provided fresh concepts and ideas regarding values and motives which helped provide other discoveries and insights.

Yin (2009) outlines six sources of evidence that can be the focus of case study data collection which were randomly selected applying replication rather than sampling logic. The field research results were derived from the documentation, archival records, direct observations, participant observations, physical surveys, and interviews and were framed and influenced by embracing of the three themes that were the foundation of the research programme. Each in their unique fashion was thought to contribute towards unearthing the complications that led to extra economic resource allocation. In some ways, the early categorisation of these sources predisposed the open coding procedures that arose and permitted new emergent categories to appear. These classes consist of a combination of human and non-physical attributes. The researcher endeavoured to utilise fully the multiple sources of evidence, created a case study database, and thus maintained a chain of evidence (Yin, 2009)

The N-Vivo software package used for the qualitative data analyses does not favour a particular methodology (N-Vivo 10. 2013, p.5) for it was designed to facilitate common qualitative mechanisms. Criticism has been raised about this type of program by Kelle (1995) stating 'that qualitative research data can be transformed into rigid automated text requiring human interpretation.' However, systems have become more sophisticated since earlier computer programs, and this judgement no longer carries such weight. Semi-structured interviews and other sources of data were imported into the system and the exploration commenced by using various analytical

techniques such as making use of a matrix of categories and inputting information in different arrays (Miles and Huberman, 1984). Coding was the commencing activity (Punch, 2005) and formed the indexing of the data and thus provided the basis for storage and retrieval. First level coding was mainly descriptive and low inference. Deeper concepts were effectuated simultaneously with the open coding, by a system of memoing, recording the theorized write up of ideas about codes related to the formulation of theory (Strauss and Corbin, 1990). The emergent categories from the individual cases were reviewed and rethought by advancing towards axial coding where concepts and ideas emerged from across the cases. Nonetheless, as Richards (2013, p.109) states, 'it is easy to do ever increasing coding especially on computers,' she suggests that when no more theory materialises to stop coding as it is the best way of stopping more ideas emerging. The researcher did not wish to fall into this trap and thereby potentially destroy the project. As the accumulation of the data advanced it became apparent that much of the classification that had already been formulated was of benefit in its own right. In that sense, the examination of relationships and the identification of trends developed as the research progressed. Therefore, the body of evidence could be built up through more classical mechanisms (Yin, 2009) and the reliance and use of N-Vivo for shaping, linking, and searching was not as substantial as first envisaged. In fact the strategy of grounded theory proportionally in time resource use in comparison with archive retrieval, case studies, and surveys was significant and therefore nowhere near as productive as first envisaged

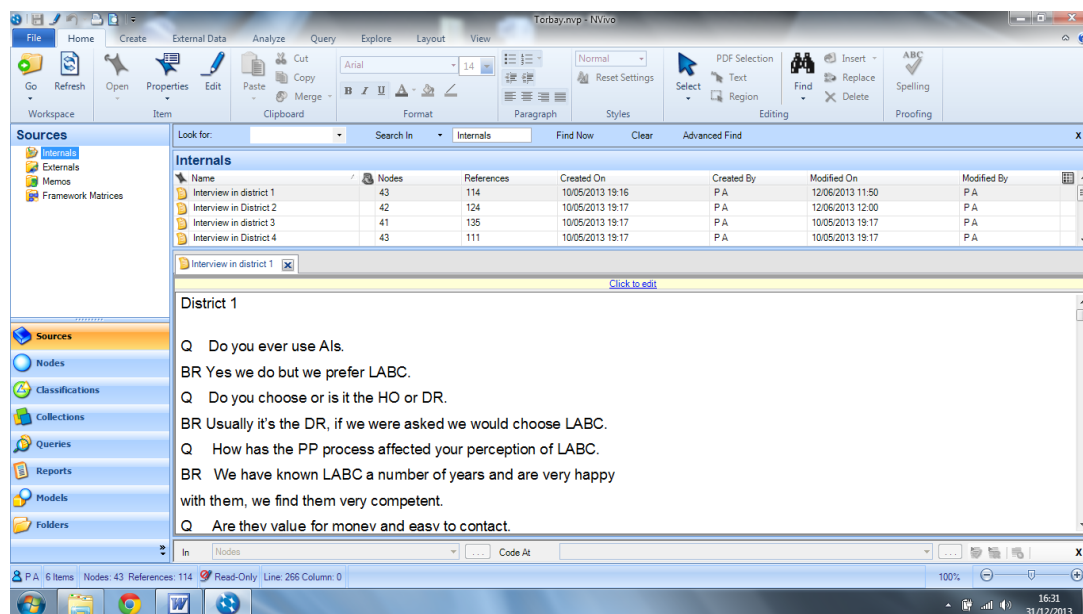


Figure 10: Example of the use of N-Vivo coding.

In combination with N-Vivo the adoption of Thematic Analysis as outlined in 3.4 was embraced to improve greater interpretation of the data. Thematic Analysis is a bridge between the language of qualitative research and the language of quantitative research (Boyatzis, 1998) and is thus an encompassing approach across a broad spectrum of disciplines. However because Thematic Analysis is particularly suited to large data sets it made it difficult to judge which aspect of the data to focus on. Further codes and themes meshed together, and the interpretive power was limited in areas where there was no theoretical framework. The analysis of the frequency codes combined with analysis of their tacit meaning offers the systematic characteristics of quantitative content analysis (Joffe, 2012). There is no clear agreement what Thematic Analysis is, but Braun and Clarke (2006, pp.79-83) claim 'researchers do not need to subscribe to the implicit theoretical commitments of grounded theory if they do not wish to produce a fully worked up grounded-theory analysis.' Similarly, Fereday and Muir-Cochrane (2015) describe the use of a hybrid approach of inductive and deductive Thematic Analysis to interpret raw data. The use of data-driven codes with theory-driven ones moved the research forward. A number of sub-themes emerged from the quantitative data and patterns began to appear, and feedback was obtained about them during the interviews.

These feedbacks were interwoven with the re-reading of the literature (Aronson, 1994, pp.2-3). The three main themes already established were used as a base but as Roulston (2001, pp. 279-280) points out 'the researcher's voice is indelibly inscribed in the research process.' Briggs (1986, pp.1-3) argues that 'the interview is the bastion of research in social science and what is said is seen as a reflection of what is out there rather than an interpretation which is jointly produced by the interviewer and respondent.' However, there was a reliance on the quantitative data which was used to triangulate the qualitative findings and seen as a way of synergising research and practice. Barrett and Barrett (2003, p.764) emphasise there is a need to develop clear and explicit consensus models or theories of construction that are informed by the needs of the stakeholders.

The researcher identified themes at a semantic level focusing on the explicit and surface meaning of the data and did not attempt to go beyond what the participants said. The latent themes which identify the underlying idea, patterns and assumptions have not been addressed. A decision was made again to simply employ the three broad themes **Governance**, **Social**, and **Technical** in coding procedures which were set out in the format above (fig. 10). These themes were broken down into constituent parts for the convenience and ease of handling the data and expanded in scope from that first formulated in chapter 2. For example, under the theme of Governance private and public control have been synthesised with Local Government into a broader approach categorised and Administering Authority.

The evidence analysis in this chapter consists of information taken from the transcripts of the semi-structured interviews, observation of the case studies, and documentary records. The sentiments of actors involved in individual cases have been set out in the field notes. The goal of the analysis was to seek an understanding in terms of diachronic context, dynamics, and structure through the individual domestic extension projects

and the participants involved in their construction. Data may be examined in various ways, the interview transcripts and researched documentation, were analysed via the three key themes, content analysis and discourse analysis (Prior, 2003; Silverman, 2006). As Lee (2009) points out, we should not treat respondents' view as explanations. Rather moving on from the descriptive story of events outlined in the field notes to analysis in which way the data are reported and probed and thus leading to an interpretation which makes sense of the accounts.

A large section of the research has been quantitative in nature through the application of statistical data such as costs, fees, time study, and market share. Studying phenomena quantitatively furnished useful insights provided the social and cultural context was not neglected. For example, Baldwin et al. (2012, p.73) suppose regulatory failure is a result of insufficient available resources. Archival evidence searched at each Authority contributed to establishing if the supposition was justified. Also it facilitated the locating of the geographical extent of the problem of resource use overruns and its the magnitude. The analysis of the data for a specific year established the number of domestic extensions applications received by each Authority. The investigation of each project file provided evidence of how many site-visits to each domestic extension had taken place. Through this technique, it was possible to tabulate the extracted data and ascertain the percentage of projects that potentially used additional economic resources. However, the documentary exploration could not always determine the reasons for the extra site-visits or the cost implications they involved. The records of each Authority were scrutinised regarding their standing orders, operational procedures, and protocol manuals to discover the similarities or differences between them. Though their corporate composition, population sizes, and geographical areas had been investigated at the commencement of the research, the archives provided some further details of their financial and industrial base. The basis of the analysis in this chapter is a synthesis of both qualitative and quantitative evidence even if it does not go as far as to use a Bayesian approach as suggested by Pope et al. (2007, p.55).

The sectioning of the literature review into three distinct themes served as a basis on which the material generated could be organised. Following the logic of this formal praxis in practice but in combination with theory thematic analysis replicated and continued the logic of these themes as presented in chapter 2. The combination of different epistemological and methodological approaches accords with the Kaleidoscopic Research Model set out by Barrett and Barrett (2003, p.755). Sections of the data in this chapter have been dealt with in a narrative manner and the qualitative reflection within the case studies and interviews follows the Periscopic approach of Barrett and Barrett (2003, pp.760-761). The surveys and preliminary questionnaires pursue their Microscopic approach. Their Telescopic and third approach permits triangulation of the data between interviews and documentary records.

The low level of applicability of academic research has been criticised by practitioners involved in construction (e.g. Argyris et al., 1985, pp.70-74; Barrett and Barrett, 2003, pp. 755-756). Actors in practice require forthright recommendations whilst academic research might appear too theoretical and due to a higher level of creation and interpretation of new knowledge not fully understood or appreciated. The distinctive characteristics of the Microscopic Telescopic Periscopic approaches make functional connections for the research because each procedure is useful in its own right at addressing divergent types of complications. The 'combining of the three approaches in a Kaleidoscopic Research Model allows differences to thrive and synergies to be sought' according to Barrett and Barrett (2003, p.755)

6.2 Governance Administrative Authority

Cognisance of the operations and functions of Administrative Authorities was limited in the Home Owners that were interviewed. They were aware of the Planning departments but failed to appreciate that Building Control and Planning perform two separate functions with different legislation and

operational methods. For example determination under Planning laws often rests with elected members, a situation which never occurs regarding the Building Regulations where all decisions are taken by the regulators. These deficiencies in enlightening stakeholders on this subject by Administrative Authorities is reinforced by the findings of Piggott et al. (2005) which revealed agencies of Local Government were often out of touch with their clientele. However, they found once work on the researched projects had commenced applicant's perception of the variance in function between departments improved. This was confirmed by the present findings when clarification of the differences between Building Control and Planning had been explained to clients by their Builders or occasionally the visiting Building Control Officer. After some probing, it came to light that none of the Designers thought to enlighten their customers of this distinction often presuming clients had been informed by agents of the Administering Authorities or were already aware. In mitigation, it is printed on Planning Application forms of Administering Authorities that Building Regulations and Planning permissions are not the same things.

Designers had exchanges with various departments of Administering Authorities. Building Control documentation verified the findings of the interviews which demonstrated Designers' contact time was primarily with the administration personnel and plan checking Building Control Officers. Liaison and interaction between Designers and site inspecting Building Control Officers diminished in Administering Authorities that separated their plan checking and site visit functions. More contact time between regulators and Designers took place in Administering Authorities who maintained the traditional system of officers both plan checking and undertaking the site inspections. The introduction of more efficient working practices contributed to a loss of communication between regulators and Designers. The reduction in the number of local offices, the introduction of new information technologies, electronic plan submission, and increased use of e-mails has lead to a curtailment of personal contacts.

Builders were the primary actors who had face to face interaction with Building Control Officers on a regular basis. Documentation and interviewee responses established that a cordial relationship existed between regulators and contractors. Builders gave impressive accounts of their association with the various Building Control departments; they found the inspectors were easy to contact and helpful and could provide no constructive suggestions on how the service provided might be improved. However the researcher appreciates these responses could be equivocal, for Etienne (2103) indicates that ethnographic studies reveal that ambiguity pervades regulatory-regulatee interactions. If regulatory encounters are indeed so ambivalent, then this notion does not easily accommodate the concept of combining persuasion with sanctions assumed by Ayres and Braithwaite (1992). The researcher was also aware that data has to be viewed in the context it was gathered, and that alternative interviewing techniques have to be formulated (e.g. Qu and Dumay, 2011), to overcome claims that interview results are often not objective.

The difference in the **magnitude** of Local Authorities in England, though undertaking the same function, can differ profoundly. These variations were taken into account at the design stage of the research. Magnitudinal variables potentially give rise to differential process outcomes between Administering Authorities. Every Authority maintained archival and current data that could be scrutinised concerning the recording of statistical evidence of additional economic resource use on any project. A pattern of extra resource use by additional site visits correlating with the magnitude of the Administering Authority was ascertained by computing their inspections records and gauging them against corporate size. Two areas of relative equivalent size and density (population variation of eight percent between the two Authorities) had an identical ratio of surveyors as the national average which currently stands at one Building Control Officer between twelve and sixteen thousand persons (Chartered Association of Building Engineers, 2014). These two corporations, one being a city the other a borough were similar except for the legal position of their civic composition.

Domestic extension one had sixteen inspections and was constructed within the city council's area, whilst extension four had four site visits and was built in the large borough. Another two projects (areas five and six) had eight site visits which amounted to an additional three inspections above the programme optimum. These two extensions were built in areas where there were substantially sized Building Control organisations, one county wide and the other a partnership between three Authorities forming a consortium. In the remaining two cases, areas two and three had five and six site inspections respectively; one was constructed in a small rural district council the other within a large Unitary Authority.

The archive evidence for the year 2010 concerning resource use overruns in domestic extensions revealed that the number of site visits exceeded the programmed number allocated in about half of all cases. This was true in every Authority researched though due to the volume of files there was insufficient time to compute an exact figure for each project. The search for causal links between resource over-runs and corporate dimensions clearly failed to find any substantive correlation. The most significant variables, apart from Authorities' size, were unique domestic extension cases and the diversity of actors involved.

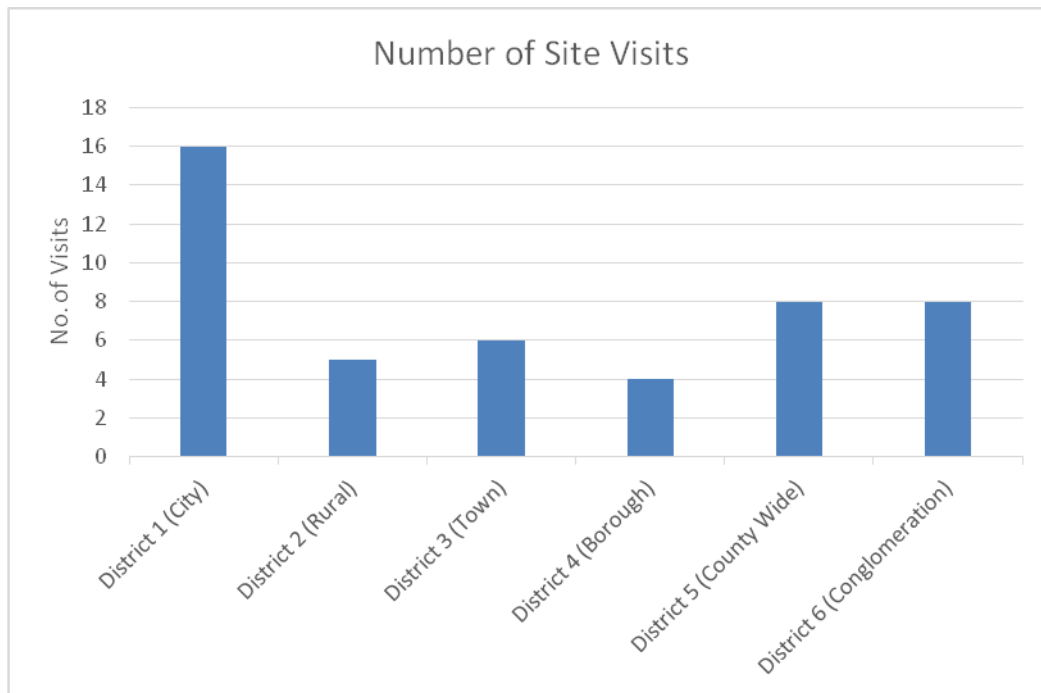


Figure 11: Number of site visits for a case study in each district

Corporate policies and how individual Local Authorities' actions might cause additional financial resource use through enforcement procedures was a further area of investigation. Records kept by each Authority concerning statutory enforcement notices, which are legal actions regarding infringements of the Building codes, were found to be limited because so few legal proceedings had taken place. The data covered not just domestic extensions but the whole spectrum of construction works that fall within the jurisdiction of the Building Regulations. From the findings of the pilot study (appendices 8&9) and reinforced by the archive retrieval, it appears axiomatic that problems of achieving compliance are located in specific denominational categories/tables of construction. The small domestic extension and alterations category B/table 2 manifests a substantial amount of non-conformity with the building codes in comparison to the volume of other types of construction projects. The quantity of rectification action required concerning domestic extensions is not replicated by legal proceedings, court action, or determinations by the Secretary of State (Department for Communities and Local Government 2015; Building Act 1984, ss.16. 30. 39.). This could be due to the expense potentially incurred by domestic extension Home Owners in challenging any litigation which

means the serving of enforcement notices alone is sufficient action to achieve compliance. The rationale that this might be attributed to or caused by differences between Administering Authorities cannot be substantiated by the documentary evidence available, particularly due to the variance in their record keeping and divergent departmental policies in enforcement action.

The ***internal structures*** of Building Control departments were similar, consisting of a manager who supervised the unit and area teams headed by a Principal Surveyor. The exceptions to this establishment were the two units whose plan checking systems were separate from their site inspection mechanisms. This permitted a specialist team to remain in one centrally run office processing drawings and applications whilst the remaining Building Control Officers carried out their district site inspections from the area offices or sometimes directly from home. All Building Control bodies had achieved ISO 9000 certification for quality management systems; no appreciable differences between departments regarding this issue could be discerned. Nonetheless, the actual impact of quality systems on organizational performance has been challenged by Barrett and Grover (1998) claiming they may not truly reflect real effectuation. One particular difference between Authorities was that four departments (districts 1, 2, 3, and 5) operated purely pursuing the Building Control function on behalf of their relevant authority. The other two (districts 4 and 6) amalgamated their respective Planning departments with Building Control and conducted both services as a combined practice. These units were split operationally but worked closely together on inter-departmental consultations and issues more so than those in other districts. The amalgamation of Planning and Building Control benefited the internal running and organisation of those Authorities that had made the transition. They shared administration, IT, and office facilities but most importantly Planning and Building Control Officers interacted with each other, and the them and us atmosphere almost disappeared. By working alongside their Planning colleagues, Building Control Officers had a greater appreciation of the complications and difficulties of the Planning system and vice versa. Most importantly due to

improved communications decision making was quickened and duplications avoided. However, no practical difference to the Building Control function and operation, once plan checking approval had been completed, and site inspection processes had commenced, were discovered in comparisons with districts that maintained separate departments.

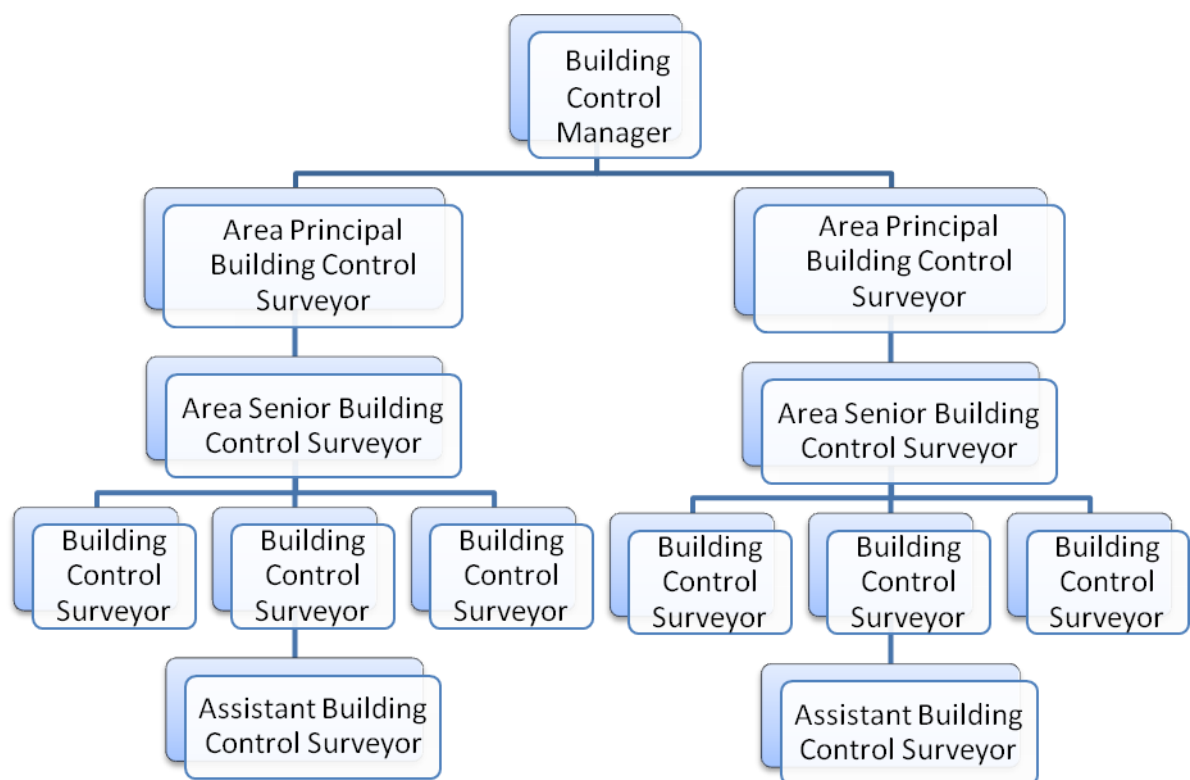


Figure 12: Typical Building Control staffing structure.

The **operational systems** of Administering Authorities' were practically identical if differences occurred on site then it was how their representatives interpreted and engaged in regulatory procedures, this is analysed in the social theme section. The study found no significant differences between Administering Authorities and their operational systems, problems and their solutions were dealt with in a strikingly similar manner in all projects.

Agency procedures problems caused by Design failures and omissions, Home Owner instigated changes, and unexpected technical complications resulted in additional site visits to some projects. To determine if the reasons for these variances were due to the procedural operations of individual

Building Control units or unique variables peculiar to each project again the Authorities' archive records were inspected. Scarce edification was forthcoming regarding these specific issues because the file notes contained only brief descriptions. Clarification with participants took place at the interview stage and revealed on-site discussions were rarely recorded in detail. Brief notes of advice, corrective procedures required and suggested methods to achieve conformity were usually the most that were written. Rectification measures were checked at the next programmed site visit, or an additional one was arranged. In this way, problem-solving became a continuing and ongoing process and did not necessarily interrupt or influence the programmed inspection routine. This perpetual and repetitive problem-solving approach appeared customary and indigenous to all Building Control bodies. No procedural diversity was apparent and within the theme of governance, there was no evidence to support the notion that resource use overruns were due to prevailing agency mechanisms.

6.3 Administrative Authority Analysis

The internal operational structures of individual Building Control Units were found to be similar. The study revealed the only exception to this uniformity was the processing arrangements and practitioner ethos which differed from department to department. This concurs with the research of Jas and Skelcher (2014) regarding differences in regulatory regimes within the UK. Practices vary much less than could be expected based on previous studies. However, in the smaller Authorities, there were much closer working patterns and a greater camaraderie between surveyors. Gray et al. (2003) found that small organisations, those less than one hundred employees, are significantly more supportive of their staff than medium or large size organisations. The combined results of the interviews with staff members revealed this phenomenon was conspicuous within the smaller departments, where there was an absence of the division of labour because Building Control Officers were obliged to multi-task. There were insufficient staff numbers to subdivide small units into separate sections in specialist areas.

Such as enforcement, demolitions, licensing, dangerous structures, or separate commercial/domestic aspects of the workload and claimed they were especially sensitive to the lack of economies of scale. Bardhan (2002) disputes this observation declaring fragmentation can be beneficial as centralised systems have lost their legitimacy. The research, in contrast, found substantial support amongst Building Control Officers for larger organisations. Actors within small Building Control bodies claimed they lacked the resources to afford new technology, nor the finances to equip surveyors with on-site communications, or easy access to relevant construction, regulatory, and engineering programs. These arguments have been challenged by England et al. (2000) who maintains localised IT solutions have diffused well in contrast to slow adoption procedures within larger organisations. Instead of funding issues being the primary reason for IT deficiencies it is the shortcomings in local management's expertise, initiative, or dynamism that are the main cause. The burden on management to be up to speed on knowledge sharing techniques, which could have a beneficial impact on these individual units, has been highlighted by Riege (2005). The interviews with the departmental managers provided evidence that public service managerialism has adopted techniques associated with profit orientated enterprises as claimed by Clarke and Newman (1997). Information Technology challenges are no longer so complex or unfamiliar, and universal adoption of relevant knowledge sharing mechanisms looks set to be embraced by all the units encompassed in the study. Arguments for the expansion of subsidiarity are increasingly used in the political arena for greater democratic accountability (Green Party Manifesto, 2014) and substantiated academically (e.g. Veggeland, 2012; Bartl, 2015).

Responses from the interviews reflected the concerns that the managers felt in smaller corporations regarding fee setting. Management being under more pressure than those in larger organisations from their local councillors due to their closer proximity and more frequent interaction with members of their Authority, rather than a bellicose attitude adopted by their political masters. Pedersen (2013) argues that contrary to the view that councillors

are motivated by narrow self-interest there is, in general, a commitment to the public interest. If it is accepted that Local Authorities have only limited influence, and little power is in local hands (Blondel and Hall, 1967) then these are strong arguments why the internal costings debate often comes to the fore. Work undertaken into best value by McAdam and O'Neil (2002) illustrates the difficulties in achieving best practice in the diverse groupings that make up Local Authority Building Control nationally. Individual units are often deficient in power or influence to achieve this aim and substantiate or defend any inter-departmental resource disputes that arise. Other constraints act upon small units, for example, scarcity of funding for workforce training and the necessary staff absences cause a curtailment of departmental outputs.

The consortium of three Local Authorities and the county-wide amalgamation of six local districts' Building Control function were classified as large units. The creation of these two grouping and the subsequent savings in administration and management costs was achieved without the resulting tensions observed by Fulup et al. (2002) where one management team tended to dominate the others. Three other units were classified as medium size and were run by their own respective councils. These medium sized departments also operated within Authorities which employed more than one hundred staff and corporately are categorised as large employers. The remaining Authority identified as small, as defined by Gray et al. (2003), employed less than one hundred staff. Correlation between the size of a Building Control Unit and economic resource allocation is purely speculative because the variables observed were not controlled or independent. These variables consisted of fee charges to estimated costs of service, problems on site, different actors, dissimilar recording and follow-up policies, and diverse geographical conditions and size. However, the inspection regimes were indistinguishable in each district irrespective of establishment magnitude, and the number of programmed inspections per domestic extension were identical.

The smallest Authority undertook the optimum number of inspections and was in budgetary equilibrium with their particular project. In the three medium size units, two were over budget and one was in balance. The two large bodies (districts five and six) both exceeded their five inspection programme by an additional three inspections each. It might appear that larger units are prone to over inspecting domestic extensions as well as some medium sized Building Control bodies, but the analysis demonstrates that where losses occurred this was due to extra inspections because of regulatory problems on site and not due to the composition of the Authority.

The documentary evidence established some diversity in the recording of site notes but minimal procedural differences operationally; none of these mechanisms had any direct influence on the requirements to engage in extra inspections due to on-site problems. Individual actors who participated at various stages of the domestic extension projects are analysed in subsections 6.8-6.15. The only functional dissimilarities that could be discerned between Authorities were some of the marginal differences in their follow-up procedures. In some districts projects that had no completion inspection request from a client required a cold call re-visit to ensure work had finished. Other units automatically contacted Home Owners if they thought works were completed requesting a final inspection. The cost implication of calling routinely until access is gained is certainly a cause of resource drain.

The fee charges for domestic extensions are based on an aggregate of the probability costs to the department, provided that all statutory inspections are undertaken. The overheads, travel, salaries, time costings, and so forth are a reasoned judgement based on these actualities. In the districts that made a project loss in every case more than the programmed numbers of statutory site visits were undertaken. The analysis supports the argument additional site visits and not incorrect fee setting cause a resulting deficit. Within the district where the cost results were budgetary neutral, the exact amount of visits programmed were carried out. Pressure on management to

set politically expedient fee charges is unsubstantiated. Programmed inspections are sufficient to ensure that a project conforms to the substantive requirements of the Building Regulations within the parameters defined by statute (Building Act 1984). When complications arise that cannot be attended to during routine inspections, then additional visits become necessary. It should be noted that all units assume that total fees are assigned as follows, one-third for plan checking and two-thirds for inspecting. This seems to be a universally adopted division, and because of the absence of strict time management procedures it would require further research to discover if this approach accurately reflects true cost centres. The composition and procedural operations of the administering Authority have no differential impact on the effect of unforeseen site problems; analysis showed similar outcomes occurred because Authorities are duty bound to ensure regulatory conformity is continually implemented.

In Summary, the departmental documentary evidence supports the argument that units set their fees at a sustainable level for the areas and conditions in which they operate; it is the variable causes of extra inspections that engineer a deficit income. In the case studies, the majority of additional site visits were due to complications on site. However, not all visits to projects scrutinised in the Authorities' archives were due these factors. Follow up and progress of works calls were further causes of additional inspections and thereby resource overruns. There were minor variations in protocols between Authorities, but these elements had no relevance within the theme of governance because their similar outcomes had a proven bearing on the volume of additional resources used.

6.4 Governance Type of Regulation

The overall accountability of Building Control has been called into question because of severance of the link between codes and procedures (Meacham et al., 2005). Every extension investigated was constructed under the

present form of regulations and no documentation existed regarding prescriptive codes to make any comparative analysis. Some Authorities', archival records dated back to 1974 which was the occasion of the change in Local government administration in England except for London (Local Government Act 1972, pt.1. s.1). These records were on microfiche and though they were available for scrutiny it was not considered worthwhile to pursue this point for three reasons.

Firstly, the issue of extra economic resource costs was not a contentious issue prior to 1985 because there were no fee charges and expenditure was met from the domestic rates: therefore, there was no necessity to document individual time and resource use per project.

Secondly, there could not be a universal search inaugurated germane to all bodies because some Authorities shred their records after fifteen years old, having no duty to keep them except those that might fall under other legislation, (e.g. Limitations Act 1980). The destruction of records was carried out for financial reasons due to the cost of storage and to avoid the expense of retrieving files for requests made under the Freedom of Information legislation, (Freedom of Information Act 2000).

Thirdly, it would be impracticable to produce any data that could lead to meaningful comparative analysis because identical cases would be necessary to establish a comparison.

The results of the interviews with the Home Owners established that they were all unfamiliar with different types of regulations. The original intention to incorporate their opinions was abandoned because they had such limited acquaintance with this issue. All Home Owners were computer literate and knew where to obtain relevant information. In practice, they did not need to consult the building codes as their drawings had been approved and there were no outstanding queries. Any difficulties they had concerning aspects of the regulations they could, if they so wished, take the opportunity to consult

their Builder or Designer. Home Owners agreed that the *raison d'être* and scope of the building codes were sensible but acknowledged they found some of the minor requirements disconcerting. However, when the reasons for these irritations and their inclusion in the provisions of the regulations were explained most respondents understood the arguments and logic behind the requirements. It may be argued that the researcher is aware he is embedded in the Building Control function and his explanations to respondents may be challenged as being biased.

The first Builder interviewed was bewildered by the jargon and terminology appertaining to the different typology of codes. A similar situation occurred with the second Builder questioned. A decision was taken for expediency that questions on this topic be discontinued. Some of the older Builders were working pre-1985, and vaguely recollected prescriptive codes but manifested a general impreciseness of detail. Builders worked from drawings and specifications and claimed it made little difference to their practices whatever the regulations were. It was suggested to the researcher if there was an occasion they might have to design something then going by the book via the simpler prescriptive codes would possibly be a more straight forward solution (e.g. Imrie, 2004, p.423)

There was a repetition in responses from Designers who were as unfamiliar with the conceptual distinctions between the codes as the other participants. The notion of system based regulations as described by May (2007, p.10) was broached but was met by some confusion. The researcher had pre-conceived notions that Designers might have had strong opinions on types of regulation, but this was not the case. For example, they might have some enthusiasm for performance codes as they permit Designers to achieve a considerable degree of flexibility and innovation. Alternatively, smaller and more orthodox Designers may be happier to use prescriptive regulations where they can design by the book. No Designer interviewed had any views on these approaches and were quite indifferent to them preferring the status quo.

There have been occasions when the notion of a return to prescriptive regulations has been raised within the Building Control profession (Sheridan et al., 2003). The idea being to replace the present performance codes, at least in part, leading to an easier understanding of the regulations by contractors and Designers because of their simplicity. However, this suggestion was firmly rejected by most of the Building Control Officers and viewed as a return to how things were pre-1985 and a change backwards. Officers were concerned it would create problems of inflexibility even though the present codes, so they believed, sometimes led to a bogging down in detail.

One Officer stated there might be a case for their use in minor works because of the simplicity of prescriptive codes which indicate exactly how works should be carried out. He did not think that there should be a change from existing performance-based codes for any other types of construction work. Long-serving Building Control Officers that had acquaintance with both methods of regulation expressed similar convictions to those of their contemporary colleagues. "Anything that puts uncertainty in the system has got to be bad; you don't want to fetter innovation," summed up the general attitude of the subjects. Concurring with this impression another said "that it would be a retrograde step," a third "you can get bogged down in detail," and another "(it) would make things a bit inflexible." There was complete agreement amongst the inspectorate that a return to prescriptive regulations would be a retrograde step, and the current codes were quite satisfactory with the caveat that they do rely on the professionalism in Local Authority Building Control.

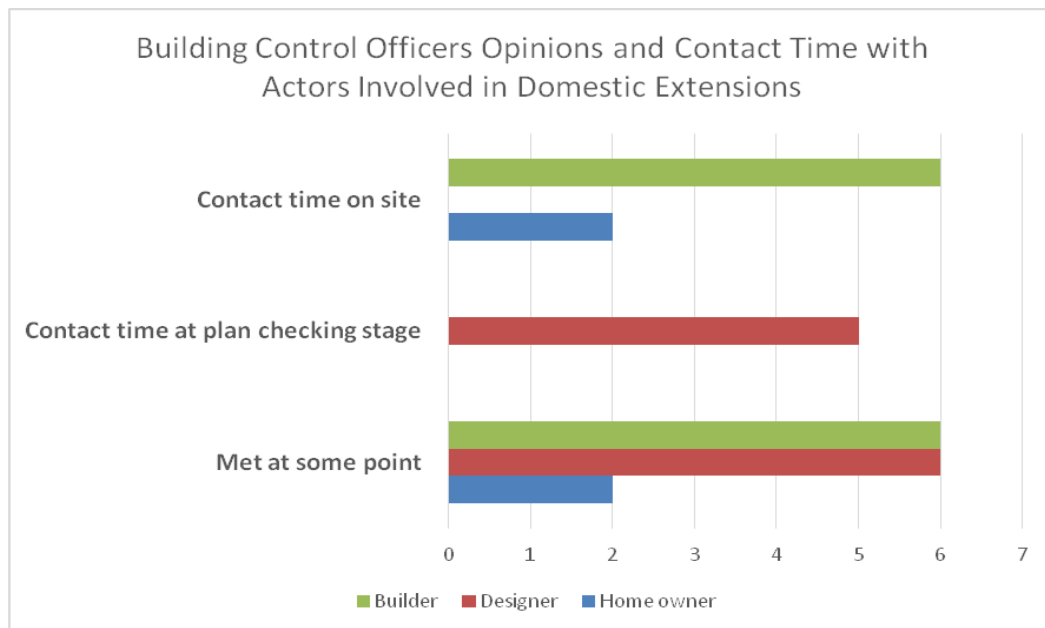


Figure 13: Building Control Officers contact time and opinions.

Building Control Officers reported relationships with Home Owners as sound, with Designers good, and with Builders excellent.

Though the regulation debate has often been about the prescriptive versus the performance issue attention has mainly focused on self-regulation. Self-regulation was introduced over thirty years ago (Building Act 1984, 4a schedule. 1.) and has grown in magnitude over time and has been altered and consolidated over time in the Competent Persons Self-Certification Scheme (Communities and Local Government, 2012c). This facility has become an important element concerning the discussion about regulatory conformity. The rationale of the debate concerning self-certification is the elimination of the Building Control element of inspection in small works. The concept behind this is that fully certified Builders and Designers would be capable of assuring their own works and confirming they fulfil and meet the requirements of the Building Regulations.

Home Owners were almost unanimous in their opinion that any form of self-certification would be detrimental to achieving compliance with the building codes. An exception to this consensus was one Home Owner who thought

that it would be reasonable to have self-certification similar to the situation that applies at present for gas and electrical installations. A reservation being made that there should be proper insurance and professional liability. This statement was somewhat modified and retracted by the declaration that “a few hundred pounds for an independent person can be OK too”. It appears most respondents felt “it was nice to know somebody is there inspecting,” “I want Building Control to make sure it is done right”, and “when someone official comes along it keeps them (the Builders) on their toes.” Home Owners in the majority of cases supported the concept of an independent inspection and checking regime

Self-regulation, as postulated by Visscher and Meijer (2002), was received with little enthusiasm from the Designers interviewed; they expressed no wish to certify their own work. Examples of comments were “I would be wary as there would be a conflict of interest,” “Well that could be dangerous,” “My own feeling is you need somebody whether that’s LABC or an AI,” and “I think there would be a bit of a conflict.” Designers preferred an independent inspectorate and feared the additional burden of responsibility and the necessary commitment to training that these measures would entail. Designers were familiar with the competent persons scheme and believed it was operating satisfactorily. There were grounds for its limited extension but no support to have some universal system which would replace the inspectorate with comprehensive self-certification.

Builders were apprehensive of the self-certification; most did not think it a good idea to extend it. The prevalent sentiment was rather conservative; they preferred things to remain as they were they were “happy the way it is,” “sounds dodgy.” Only one Builder thought it might be a good idea to expand the scheme so that it applied to just small jobs.

The views of the Building Control staff on this subject were more comprehensive as they possessed greater knowledge both concerning the competent persons scheme and the principles of self-certification. They

were in total accord on this issue and had no enthusiasm for this proposal. “I don’t think it is a good idea,” was a typical comment; similarly, a surveyor added, “you would need somebody overseeing them (the Builders).” Finally summed up in one Authority “if everyone is self-certified it would be like a car owner carrying out his own MOT.” They were united in their opposition to total self-certification though one manager allowed it to could be an option but formulated on an insurance risk basis. The inspectorate’s opinion is that to change the system to cover an entire project would require a much broader and deeper knowledge base similar to that already commanded by professionally qualified Building Control Officers or Approved Inspectors.

Self-certification or an expansion of the competent persons scheme is mooted as a way to reduce wasted resource use (Communities and Local Government 1998 and 2009c). The Government is committed to expanding the scheme and in 2014 invited applicants to operate new or extended schemes. In fact, the amount of work undertaken under the scheme has increased by nearly 50% from 2006-2015 (Communities and Local Government, 2015c). A review of the system concluded that it was operating well in most cases, and no fundamental alterations to it were necessary (Communities and Local Government, 2014b). What the limits of expansion are have not been stated or if there are proposals to include all aspects of domestic extension works.

Questions regarding system based regulations (May,2007, p.10) were not put to any of the respondents. The focus on processes and targeted social goals has not received even a notional degree of acceptance within the industry and this alternative philosophy has not been seriously rendered as an option. This being the present position it was deemed unwise to venture down this avenue due to the substantial amount of interview time that would have been wasted explaining the system.

6.5 Type of Regulation Analysis

No evidence from any individual case study was produced that identified if regulatory ordinances influenced site inspection procedures or were the genesis of any other predicaments during the construction process. Practical on-site building surveys were of no help concerning this issue and on reflection, it was unrealistic to ascertain a comparison of regulatory typicality from projects that were only built to current performance codes. However, Blind (2012) maintains regulatory frameworks are an important factor in the field of innovation and lead to improved construction methods and techniques. Seall (2004) also confirms the view that the present performance regulations can be a spur to innovation and that it is the previous over prescriptive regulations that stifle invention and cause problems. Therefore, performance regulations may have encouraged better end results than might have occurred under the old system. Builders and Designers may have been aided by the codes to take some imaginative actions, but whether this could influence a diminishment in resource overuse, there was a lack of evidence on which to base an analysis. All actors involved conducted their respective functions in accordance with the established legal framework and standards set by the Department of Communities and Local Government (Building Act 1984).

Imrie (2007) suggests that Building Regulations are entwined with, and are constitutive of Designers' practices supporting the argument that Building Regulations influence Designers' creative processes and practices. Ingenuity and creativity were not the pre-eminent traits associated with the species of Designers involved in this section of the market. The advantages of integrating performance-based approaches into practice as outlined by Hammond et al. (2005) seems even less appropriate due to the small scale nature of Designers' practices in this sector. This view is supported by the Designers interviewed whose sentiments lay with more prescriptive guidance rather than searching for more innovative ways to achieve

conformity because most domestic extension projects are not at the forefront of groundbreaking design. Imrie (2004) emphasises the government's ambition for the Building Regulations to play a fundamental role in the delivery of design quality and the hope that the use of local materials can be incorporated into dwellings. Analysis of the data supports his research findings that this unlikely to occur and advocates that regulations in the current form have insignificant influence on Designers in this particular field of construction. Life might be easier with other types of regulation, but there is no evidence to support that any change in the types of building codes would prevent problems that lead to additional resource use.

Builders were unaware of any potential variance to the present sequence of performance-based codes. Inquiry into constraints and drivers about the current format of regulatory control could not be ascertained amongst this cohort. This was disappointing as the views of Gann et al. (1998) who argue that performance-based regulations are treated as static sets of technical requirements with an effect similar to the old prescriptive codes could not be researched. A major reason for performance based construction is that it is commonly advocated as a powerful way of enhancing originality (Sexton and Barrett, 2005). Domestic extensions in the main are traditional in design and construction, and Builders engaged in this sector of the industry often fail to conceptualize or focus on originality and are usually far from avant-garde in temperament. In general, Builders appear blasé about the regulations though often critical of certain aspects of the codes in particular and/or the reasons for their implementation. They may believe that regulations have been established to protect against danger, and the results of poor and unthinking methods of construction but as Schodek (1976) emphasises they do not take or demand a more active role in shaping these regulations. The Builders interviewed wanted to construct extensions in an orthodox manner in accordance with familiar regulations. They had no desire to see change and would prefer things left alone and to continue in practice in accordance with conventional techniques.

The subject of regulatory theory was not discussed with any of the regulatees, for example, that expounded by Kling (1988) who argues that existing theories are limited. He believes a rational and enlightened state can not regulate through the market and details four types of regulation.

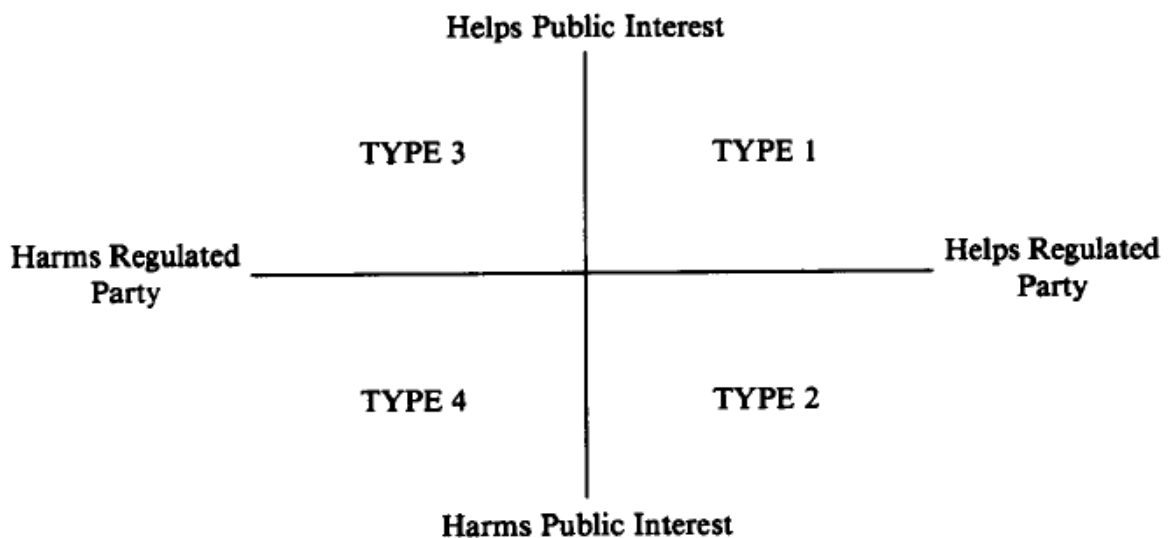


Figure 14: Regulatory theory.

Only type 1 helps the regulated party, and the helps the public interest. However, these matters were broached with the regulators who were familiar with the issues concerned. The debate centred about which system was the optimum to accord with a type 1 regulation and the consensus was that the present system helps the public interest and the regulated party. They unanimously agreed a return to the old regime would cause more problems than it would solve. The present structure was preferable and working better than the previous procedures under the prescriptive regulations in operation a generation ago thus contradicting the assertions of Gann et al. (1998). This does not necessarily mean that they believe there is no valid argument for the case of a partial return to the old system under certain circumstances. One Building Control Officer imagined it might

be helpful if applied to domestic extensions only. However, any prospective advantage to small projects was thought to be outweighed by the extra documentation requiring enactment through statutory instruments by the Department of Communities and Local Government. However, Noam (1984) suggested, at the time of the change from prescriptive to performance-based codes, there was a correlation between company magnitude and regulatory rigorousness implying that the larger a contractor, the more likely they were to be familiar with the Building Regulations and or intimidate the inspectorate.

Though the concept of different regulation types and theories were unfamiliar to the majority of participants, the notion of self-regulation was a well-known theme to most. The exceptions were Home Owners who sometimes thought of self-regulation in psychological terms and personal agency perhaps as Schunk and Zimmerman (1997) explain through a system of biased self-monitoring. Designers, Builders, and Building Control Officers rendered an emphatic negative response to this section of the regulatory inquiry affirming the maintenance of an independent inspectorate. They thought that self-regulation could lead to conflicts of interest and actors failing to be up to date with the regulations. This contrasts with the Department of Communities and Local Government's position (Communities and Local Government, 2009c) which seeks ways to extend and enhance the competent persons scheme. Though there was opposition to Government proposals, some regulators acknowledged that it had some merit as an insurance based option; if that was the way the political agenda was developing. Globally industrial self-regulation is an increasing trend (Wotruba, 1997) and is a plausible agent in influencing government action in this direction. Designers had no enthusiasm for self-regulation their judgement should be considered within the context that this specific cohort operates in the field of minor works only. Klettner (2012) advocates the cutting of regulations as they are hindering housing construction but is an argument that favours large projects. Likewise, the opinions expressed in this research are only of small contractors who were vociferous in their

conviction that they would not welcome the additional obligations self-regulation would involve. There were concerns about liability issues particularly regarding insurance companies' willingness to take on the risk. Also, there would be a requirement for some method of examining Builders' competence to undertake self-certification, time and training spent acquainting them thoroughly with the Building Regulations would add a financial implication to the equation.

Barkenbus (1983) found resistance regarding shifting responsibility for safety away from the regulator and considered in part a cost-cutting exercise. Mackenzie and Lucio (2005) state "the manner in which regulatory change may be prosecuted also belies any notion of unproblematic transfer of responsibilities between actors." These opinions are confirmed by widespread resistance if not actual hostility against self-regulation amongst the subjects involved in the case studies. The orthodox nature of many of the participants was a fundamental reason why they were reluctant to see change when from their view point things were satisfactory as they are. The system at present was regarded as sufficient by those involved in the day to day construction of these types of project. This kind of response was because Designers and constructors are only very small or small sized players in the field compared to those undertaking major or volume works. What serves complex and large-scale projects may not be appropriate or applicable to domestic extensions. Designers and Builders are resistant to self-regulations for good reason, their proficiency concerning the regulations and their expertise and skill level in this area would have to be enhanced sufficiently to undertake any new role adequately.

It was impracticable to attempt a comparative analysis of self-regulation concerning domestic extension regarding the expansion of the competent persons scheme as this suggestion by the Department of Communities and Local Government has not yet come to fruition. It would be difficult to see how any future enlargement of the scheme might operate as at present it is designed for specific task allocation such as double glazing, electrics, and

gas installations. The scope of the work carried out on domestic extensions is greater in range than these well-defined tasks. Builders work within the parameters of a complex system of assignments and functions in their day to day operations covering a much wider range of skills and capabilities. Likewise, if Designers and Structural Engineers took full responsibility for their plans, as is the case in some European countries (Visscher and Meijer, 2002) they might have to acquire a far greater level of expertise than many possess at present. Insurance indemnity issues are a further limitation to the practicality of implementing such a scheme and were a rational reason why this idea is not favoured. At present it is possible to argue that an improvement in site inspection rates might be achieved by the introduction of self-certification or an enhancement of the competent persons scheme because there would be a reduction in the requirement to visit and check. The outcomes might not prove so beneficial in achieving compliance because problems could be present that require subsequent remedial inspections. This reasoning is speculative conjecture, but any potential improvements in the rates of site inspections have to be grounded in the operational evidence of the existing system which obliges direct responsive measures to problems on site as they occur. Work undertaken by Flueler and Seiler (2003) on risk-based regulations to make the law more transparent and efficient provided some indication of the difficulties entailed in formulating standardized approaches to this problem.

Concisely, the inherent resistance to any change in the system by the majority of participants either side of the regulatory divide demonstrates the difficulty any further statutory legislation in this field would encounter. It would only solve the problem of excess economic resource use by partially removing or even abandoning the input of Building Control. There is no documentary evidence to support the idea that the type of regulation is a cause of economic resource overruns.

6.6 Governance Type of Application

Two types of application are permitted for Building Regulations purposes, either a *Full Plans submission* or a *Building Notice*. The differences between the two schemes have been outlined in 2.11 above. None of the case studies were constructed under the Building Notice scheme, and no comparative evidence was available. Departmental archive material revealed that some applications for domestic extensions had taken this route, and that additional inspections had occurred in many of them. This avenue was explored to a limited degree but it would have required a separate full-scale investigation for any case identification and would not have met the random selection strategy criteria of the present inquiry.

Home Owners were ignorant of the two types of application and the fundamental working of both methods required explaining. They were somewhat amazed that taking the Building Notice approach one could commence building without drawings forty-eight hours after submission. When the difference between the two systems was explained comments regarding Building notices included, “that puts a lot of emphasis on the BCO,” “the Building Notice is not the way we would go,” and “you would have to know the Builder pretty well.” Home Owners lacked an elementary knowledge of the mechanisms Building Control bodies undertook in utilising the application process.

Full Plans applications were the preferred method of submission of all Designers interviewed. This particular route provides an opportunity for Designers to interact with Home Owners at the initial stages of their engagement providing time to produce drawings and specifications that accord with the Home Owner’s concepts and wishes. Once agreement has been obtained for the proposed scheme by the Home Owners and Planners, Designers can move to the next stage of the process and submit an application to the relevant Building Control body.

The Designers in practices that were partnerships were apprehensive about Building Notices as they have the potential to curtail their services, as one said: “it cuts out my involvement.” “We never do Building Notices; we do regulations because people pay us to do regulations,” are illustrations of answers that confirmed this position. Another Designer stated categorically that the practice never uses a Building Notice and was “not happy with it.” They only ever submitted Full Plans when applying for Building Regulation approval. A different Designer thought it advantageous as a transient solution “it is useful if we are short of time,” and “because we want to start early onsite.” Note, though this approach may be used by Designers there is no legal reason why a Full Plans application cannot be submitted and work commence legally after forty-eight hours whilst details and drawings and checks can catch up over the following period (Building Act 1984).

The Designers in smaller or one man practices took a more pragmatic approach. “I think it should be very stringent on what it is used for, say jobs up to one thousand pounds,” was a common inclination”, “restrict it to what they call small schemes such as ten square metres,” and “ we use it sometimes just because we want to start early on site, a two metre flat roof extension is alright.” The responses endorse a general view that Building Notices are useful for tiny works and also permit work to commence quickly on site after which full plans approval can be determined later on as construction progresses. The consensus amongst Designers is that Building Notices are precarious and partly or wholly exclude their contribution to the design process. Comments such as “it has been abused”, “It cuts it back from us” and “it's risky” being typical responses.

In general, the Builders interviewed did not believe it was in their interests to work under the Building Notice scheme. The primary reasons were they would have no specifications and perhaps only Planning rather than Building Regulations drawings to work to. Tendering for a project would prove impractical as there would be a dearth of relevant documentation; there

were concerns that Building Notices were used by rogue or less qualified Builders as a way of circumventing the building codes. Though one Builder expressed that he had no preference for either type of application system the majority favoured the use of Full Plans. Comments such as “a lot of cowboys use it,” “it’s done as a short cut,” “it puts you under a lot of pressure,” and “I’m not happy with it,” manifests the degree of scepticism articulated by them regarding this subject. One contrary opinion was voiced by a lone Builder who stated “We use them, it works fine theoretically. We just liaise with the LABC.”

Building Control Officers largely oppose the use of Building Notice applications for use in most types of building construction where its use is permitted. “It’s better for small works,” “a cost-cutting exercise,” “There’s a lot of problems on site,” and “open to abuse,” reflect the views of the majority. There was support for its use on minor works with statements such as “good for simple things” and “far better work over a certain amount was done on Full Plans.” “BNs take longer to do as people who tend to use them are generally people who don’t engage Designers or professional Builders,” encapsulates the general view of the inspectorate. This circumspect attitude entirely mirrors the results of the government inquiry into the Building Notice scheme (Communities and Local Government, 2008b).

Full Plans applications are the preferred option of most Building Control Officers because they are provided with details of construction proposals and have more confidence the completed project will conform to the requirements of the Building Regulations. With Building Notice applications they are often unsure of the construction details and have less personal assurance that they have not overlooked contraventions during their site inspections. They are often uncertain about how to approach or estimate potential and unforeseen construction problems that may materialise at a later stage in the project.

Table 4: Participants' responses regarding the use of Building Notices.

	Builders	Designers	Building Officers	Homeowners
Case 1	Never use.	Useful if full plans are slow being approved. Ok now and then.	No, don't like it. Open to abuse.	That's not the way we would go, did not know the difference.
Case 2	Not happy with it. A lot of pressure on Builder.	Only use for tiny jobs.	Best for very small projects.	Did not know the difference.
Case 3	Ok for small jobs.	Ok for little projects, how can big projects be controlled.	Restrict to jobs of no more than 10m ² .	Ditto.
Case 4	Fine In theory, but still need guidance.	Ok for small porch, it cuts out the Designer. Use for jobs up to £1000.	Tend to be used by unscrupulous people.	Ditto.
Case 5	Full plans are better as you know what you are doing. For bigger jobs it's not so good.	Use it sometimes if I want an early start on site. Ok if you have a good builder, ok for 2m ² jobs.	Don't like it, ok for very simple things.	Ditto.
Case 6	Not a level playing field for the Designer.	Never use them, too risky. Cuts back from the Designer.	Ok for extensions, but not too much use, lots of problems. Ok if Builder has knowledge.	Ditto.
Summary	Full plans are better. Not a level playing field.	Used if plan checking is slow. Ok for very small jobs, risky, cuts out Designer.	Used by the unscrupulous, ok for very small jobs. Restrict to 10m ²	None of the Homeowners knew the difference between the two systems.

6.7 Type of Application Analysis

The random selection of domestic extension projects chosen for the research programme failed to provide any application submissions under the Building Notice scheme. There being no variable in the method used to apply for Building Regulations approval the data could not be analysed for a specific type of application. Any information on which to analyse the proposition that the kind of application may influence extra resource allocation was only generated from the interviews. For this reason, triangulation of the data sets in this section of the research could not take place.

The field notes of the conversations make it clear that Home Owners had little comprehension of the alternative method to a Full Plans Building Regulations application. Though if they were truly interested in the subject, the system is simply explained and easily accessed online (e.g. LABC, 2014b), the rest of the participants were aware and fully knowledgeable of both procedures. Designers were apprehensive about the Building Notice scheme principally because it has the potential to divert commissions away from their practices. Their main advantage from the Designers perspective was this route can be employed if there was an urgency to commence work on site before Full Plans can be finalised. From their standpoint, it was logical to limit Building Notice use to very minor projects that would not warrant the potential fee charges incurred if they worked up a Full Plans application.

Builders acknowledged a preference for the Full Plans route as it permitted them to price and build to an approved drawing. They sensed little jobs which were simple in nature and where there was more of a level playing field were as far as they would wish the Building Notice scheme to be used. Building Notice applications can impose additional pressures on Builders as they may have to seek third party guidance regarding the building codes. These sentiments correlate with the responses provided by the Building Control Officers who tended to hold the opinion that if Builders had sufficient

knowledge of the codes only then could Building Notices be useful. They agree that they should be limited to small works, and their use is open to abuse and often taken advantage by unscrupulous persons.

The interviews were essentially exploratory, but the Building Control Officers (regulators) do possess expertise on this subject. The pluralistic nature of the process of construction of the domestic extensions was recognised through the multiple interviews with the other actors involved (regulatees). Previous inquiry concerning Building Notices (Communities and Local Government, 2008b) reinforces the present findings that there is support for limiting their scope to smaller projects. The interview data, with the exception of Home Owners, strengthens the view that on-site problems were more likely to occur with a Building Notice application. No empirical evidence has come to light from the present research to substantiate this opinion. A study of defects in construction by Baiche et al. (2006, p.283) did not suggest that the type of application for Building Regulations was ever a root agent for any of the defects they observed throughout their report. No other body of work has yet been found to illuminate further this phenomenon. A separate inquiry into extensions constructed using the Building Notice route would be required to authenticate the assumption they are a cause of resource overruns and would be a worthy subject of future investigation. Building Control Officers claim to spend a greater period of time on site on contracts that use Building Notices, but this does not mean overall extra resource use to the department occurs because less time would be spent on administration because there is no plan checking element for this type of application.

No empirical evidence was discovered that the type of application had an influence on economic overruns. Neither the personal views of the respondents or the review of the literature could prove conclusively if Building Notices were a greater cause of additional resource use than Full Plans applications.

6.8 Social Home Owners' Views

The views of Home Owners regarding their opinions of the other actors involved in the construction of their respective domestic extension projects were requested during the interviews. The outcome together with the relevant documentation and any effects that resulted in additional resource usage by the inspectorate are given below

Designers

Home Owners have less interaction and contact with Designers in comparison with Builders. In two cases the Home Owners were extremely critical of their Designers and the drawings produced. They were disappointed with the plans that were generated and/or the number of mistakes made both in the drawings and specifications. On the other hand, one interviewee gave praise to the finished drawings and commented how satisfactory they were. Concerning the other three projects, there was a professional association between the Home Owners and the Designers. The Building Control files revealed all submitted drawings were approved by the inspectorate, and none were rejected. This would not be unusual as normally refused plans would be resubmitted with the necessary corrections and amendments and then passed when in compliance with the building codes. This is what occurred in practice in two cases, a checklist of outstanding points concerning the meeting of the requirements of the Building Regulations were sent out by Building Control to the Designers who then returned adjusted drawings to address and rectify the outstanding issues. The discrepancies and omissions in the specifications that unsettled the Home Owners or caused problems on site for the inspectorate were not manifest at the plan checking stage when examination took place for conformity with the Building Regulations. This can be explained by the fact that Designers' survey details and measurements have to be taken as correct by the inspectorate because there are no appropriate means to dispute or verify them until work commences and the site is visited.

Builders

The literature review indicated that there was a general perception amongst the public that cowboy builders are primarily to blame for the problems of non-compliance within the construction industry. No Home Owners ever mentioned that their own Builder could be regarded in this manner usually considering their own contractors quite positively. In all but one case the Builders that were engaged were either recommended or known personally to the Home Owners. The method of selection of the Builders was partly through friends and acquaintances or enquiry of third parties who had similar construction works satisfactorily undertaken previously. The study showed that the relationships between Home Owners and their contractors were predominantly agreeable and amicable, described in one case as extremely good. The relationship was characterised as unsatisfactory in only one instance and not for the quality of work but due to the overrun of time and costs.

Building Control Officers

Replies from Home Owners were encouraging for public sector service provision. Interviewees dealings with individual Building Control Officers varied, some people were at home during the construction period, so they had contact with the inspector. Others were at work, so the Builders dealt mainly with the Officer. Comments on individual relationships where they occurred were positive ranging from "I had no trouble with him", "a pleasant enough bloke," "fine," "super chap," and "great." Concerning the service provision, there was unanimous approval. Interviewees had no problems regarding communicating with individual inspectors or their offices and felt queries were dealt with efficiently and rapidly. There was praise for Officers helpfulness, the promptness of site visits, their accessibility, and their knowledge base. When the subject of Building Control service arose only one recommendation was recorded, "the Building Control Officer should be closer to the area he covers regarding time and travel costs." No other

respondents offered any suggestions for refining the existing way services were provided and most were satisfied with the existing provision.

6.9 Home Owners' Views Analysis

The researcher was aware that the literature could influence the questioning schedule and interpretation of the responses and endeavoured to tease out the underlying concepts of the respondents' in answering the questions. For example, some research did suggest that Home Owners colluded to violate the Building Codes (e.g. Rukwaro, 2009) but this was not substantiated. Though the public lacked understanding of the codes, their high expectation of the Building Regulations was confirmed by the findings of Cooper, (2003). Two respondents did have previous regulatory experience because they had projects constructed in the past; they relied on the other professional actors involved to a similar extent as the other Home Owners.

The level of home ownership in the United Kingdom has changed over the past half-century from about thirty percent of the population owning their own property, peaking at sixty-nine percent in 2001 and declining to the present level of sixty-four percent (Office of National Statistics, 2013). This was due to a worldwide real estate boom and especially access to cheap money in the last decade of the twentieth century a view championed by Allon (2008). After the crash of 2008, she contends six out of ten Home Owners were actively improving their property and drawing down equity in the property to fund improvements rather than move. This correlates directly with the evidence gleaned from the researched Authorities' Planning applications registers for 2010 which revealed an increase in domestic extension activity over and above the previous years.

Building Control departmental records gave no precise indication that any activity by Home Owners resulted in Building Control Officers having to undertake additional site inspections. Neither was there any extra resource allocations recorded specifically due to clients' alterations, queries or problems. On comprehensive probing, the respondents did indicate there

were on site complications which were specifically attributable to the Home Owners' actions, one problem each in two case studies as set out in 5.2 and 5.5.

The building surveys of the completed extensions failed to provide any perceptible indication or evidence of Home Owners requested variations or departures from the approved drawings. The very nature of a physical building survey does not lend itself to differentiate between the inputs of the participant actors. Exploring the personal documentation of the Home Owners, evidence was discovered that established clients had revised their specifications and decisions about the works as construction progressed. Through triangulating this specific data to Building Control Officers' site notes the only certain change in the regulators' activities were occasioned by the two problems previously mentioned. It appeared that any other Home Owner induced changes were either not relevant to the statutory processes or those that were had been accommodated as part of the programmed inspection regime. Though May (2004, p.48) argues that regulatory compliance is often fulfilled by Home Owners as a shared commitment to fulfilling an implicit regulatory contract the data does not necessarily substantiate this view, particularly as most Home Owners had limited contact with the regulators. May and Winter (1999, p.628) also acknowledge that cooperation with the regulator is enhanced by greater awareness of the codes. Their findings are of little relevance to the present study because analysis demonstrates that Home Owners, in general, have scarce cognizance of the building codes and depend on the professional knowledge of the qualified actors involved in the project. Home Owners' decisions regarding actioning alterations or amendments to the design are basically ascetic and often cosmetic. It was apparent from the data that Home Owners when requiring alterations and adaptations to their extensions consult directly with their Builders and not their Designers. The reasons for this are time and money, Builders are on site and can get things actioned rapidly and perhaps not charge a fee for attendance.

Home Owners actions had an impact on extra resource allocation to Building Control entities but were not the primary cause of additional site inspections. As officers often had little interaction with Home Owners on site, analysis of the interview data and documentation reveals that there is only limited Home Owner influence on outcomes that could have any possible impact on extra resource allocation by the regulator. Their perception of Building Control was positive as was their interaction with their Builders. Their relationship with their Designers was more strained and problematic, and this lack of communication between the two parties partially contributes to on-site problems and ultimately resource use overruns.

Triangulating the archival data with the interview records, it was evident that Home Owners actions in requesting design alterations had an influence on Building Control's finances. The additional resources incurred spent travelling and visiting site to re-inspect together with administration and Surveyors' structural calculation checking time contribute to budgetary losses on projects where this situation occurs. Home Owners had no knowledge of the extra work involved on the part of the regulator that their modifications entailed.

6.10 Social Designers' Views

Domestic extensions are a minor component of overall construction activity in monetary terms but are a significant element in numerical terms (Rhodes, 2015, p.5). For example, a multi-million-pound city centre development might require one Building Regulations application the same as an extension. This segment of the industry is attractive to smaller Design practices with frequently less qualified personnel but often with much experience (Chartered Institute of Architectural Technologists, 2015). Designers' involvement with clients is different to that of major projects where interaction is at a corporate level. Likewise, the range and overall levels of expertise of the contractors involved is below that on major construction sites. Building Control Officers have more intimate contact with

small scale Designers as they may be dealing with the same practice over some years and often build up substantial relationships.

Home Owners

Designers had no set opinions regarding their clients; each Home Owner was regarded on their own merit. Personal relationships were built up as proposals and ideas interacted between the parties concerning each project. In two projects the original Designers were dismissed and not interviewed, one because the discharged Designer refused the invitation and in the other case the Home Owner requested the researcher not to contact his original Architect. The two replacement Designers were responsible for the Building Regulations applications, so it was impossible to infer any causal linkage by the previous Designers affecting the construction part of the project or indeed if the Home Owners opinions regarding their relationship had an influence.

Builders

Designers' opinions about Builders were rather ambiguous, those who knew the Builders that were working on their projects appeared to have a high regard for their workmanship. If they were unaware what contractors were engaged on an extension they had designed, they seemed neutral on the subject. Mainly they were wary of Builders they had no knowledge of and had a sceptical view of other contractors in general. "Certain Builders around here would be hard pressed to build a dog kennel," Sums up their general position.

Building Control Officers

The ease with which Designers can make contact with Building Control appears to be a more important factor in using the service rather than any poor relationships they might experience with the Planners when choosing between private or public sector bodies. There was a single individual who was somewhat critical of Local Authority Building Control being slow "I find it is the time factor trying to get hold of people, but I haven't a real problem."

The rest of the Designers thought contact was easy, with comments such as “absolutely but mostly it is all done by email now,” “no problem getting through to admin,” and “yes I find them very helpful.” Public sector Building control service seems to be regarded favourably by the Designers. Comments such as “They have changed a lot recently and they are really helpful now,” and “they are nice to deal with, just more professional,” are typical. That respondents were satisfied with the manner in which the system functions was reinforced when suggestions were requested for ways service provision might be enhanced or reformed. Five interviewees could not think of any problematic issues and any ideas or ways things might be improved. A characteristic statement was “I have no issues; the system seems to work well.” Minor criticism was expressed by one Designer commenting “that if a BCO is away, no one seems to know what is going on.”

Efficiency savings and changes in work practice by the inspectorate have had an impact on Designers. Electronic submission for Buildings Regulations purposes has been widely adopted by Local Authority Building Control. Designers accept the advantages of the system though the older ones seem to be apprehensive about using it. Comments ranged from “if it is compulsory I think I would hang up my pens,” to “I will go with it,” and “if you can’t cope with it you shouldn’t be doing it.”

6.11 Designers’ Views Analysis

Spatial pressures placed on the home as Hand et al. (2007) contend results from the accumulation in the increase of consumer goods, and this is a major reason for the construction of extensions and engagement of a Designer. The majority of communication between Home Owners and Designers concerned the obtaining of the relevant consents once their objectives had been achieved interaction between them usually terminated. Discrepancies in the drawings from thenceforward were identified and rectified by the actors on site during the construction phase. Designers had

little contact with Builders but if known to them previously were regarded as competent. However, their opinion of unknown contractors was circumspect. Their opinions regarding Building Control and the Officers were quite favourable.

Designers were usually unaware of problems they had caused on site because they mostly had no further contact with their clients after their applications have been approved and remained ignorant of mistakes they had made or those that subsequently emerged. This contrasts dramatically with larger projects where the Designers have an input throughout the construction phase of the works. Baldwin et al. (1971) listed design changes and incorrect drawings as two potential areas out seventeen possible causes of construction delay. The Builder is the principal actor on site to bring these problems to the attention of the Building Control Officer, and this may provide part of the explanation to why Builders are often regarded as a source of inconvenience and labelled in a derogatory manner. Based on the analysis of outcomes, who pays for the mistakes of the Designer that incur extra resource use? Guckert (2002, p.49) suggests the importance of communications and risk management strategies to provide some remedies; these will be discussed later in the solutions chapter. Building Control Officers rarely have contact with Designers once work on site has commenced, but the inspectorate is regarded by them as competent. Eleven mistakes were caused by Designers in four cases in 5.1 5.2 5.4 and 5.5 (Appendix 14).

It was clear that design issues were the reason for a substantial number of regulatory problems on site. Only one project of the six cases failed to display any issues directly resulting from omissions or mistakes in the drawings or specifications. Extra regulatory site visits were required due to complications in detailing, specification, or other design processes.

For practical purposes, most of the discrepancies and design faults that occurred ought not to have manifested themselves. Hymer (2002) advises

about the dangers of employing unqualified Designers warning that similar to Builders they do not have to be registered and if they are members of a professional body what is their level of membership and in what discipline. Designers involved in this study were experienced and had been in practice, at least, fifteen years and in most cases for a substantially longer period. Two were chartered (RICS and RIBA) and three belonged to a recognised professional organisation (CIAT). The size of the practices ranged from four persons down to the majority consisting of one person enterprises. The project which experienced no extra Building Control site inspections and the extension with the greatest number were both designed by single practitioners. The two larger partnerships had one and two problems each.

When Designers submit plans and specifications to the relevant Building Control body, discrepancies, omissions, and non-conforming details are pointed out for rectification on a checklist and then returned by the Authority to the Designer. Once these discrepancies have been rectified and amended, then the application is approved. However, items for example, such as boundaries or dimensions, are taken as given by the Building Control Officer responsible for the plan checking. If these details are incorrect or omitted, then these deficiencies do not come to light until work has commenced. Accurate site surveys and investigations would have resulted in the elimination of the eleven of the non-compliance problems that occurred.

In summary, individual Designers held similar opinions regarding other actors involved in domestic extensions as their colleagues. However, they were oblivious to their own mistakes and errors causing additional resource use to the regulator. The building surveys, documentation of the Home Owners, the interviews, and the related files examined in the Building Control Authorities' archives demonstrate the cause of the majority of extra resource use lies at the feet of the Designers. There was no correlation regarding design

mistakes between Designers' size of practice, their length of time in their occupation, or their membership of differing professional bodies.

6.12 Social Builders' Views

The interview questions with the Builders focused particularly on the construction and Building Control processes of the domestic extension rather than on the generalised buildability and quality control mechanisms and produced some intriguing results. A general assumption (e.g. Cow Boy Builders, 2012) also alluded to in the proto-hypothesis (1.3), is that substandard Builders cause most of the problems concerning non-conformity with the Building Regulations. Though the research is aimed at developing a pertinent hypothesis, the researcher has at times been informed by various colleagues that the cause of extra economic resource use is self-evidently bad builders. These anecdotal assumptions contradict the acknowledged harmonious relationships which most Building Control Officers admit exists between them and their contracting clients.

Home Owners

At first, most Builders appeared reluctant to speak about their customers, perhaps thinking that confidentiality rules may be infringed, or the researcher might had the intention of feeding back information to the respective clients. Once they were thoroughly assured on these issues, they became more relaxed. In general, they believed they had a good working relationship with their respective clients. One Builder had difficulties regarding cost over-runs and pace of work but had actually undertaken a number of projects for that particular customer. It appears Builders maintained a good relationship with Home Owners but did speak of some frustrations and annoyances that they had experienced on other jobs in the past. The main cause was clients changing their minds regarding aspects of the construction other issues included alterations to the specification, slow payments, and customers continually watching the progress of works.

Designers

None of the Builders had any contact with the Designers of the projects they were engaged on; they worked purely from the drawings and specifications. Some did mention on previous works they had occasion to contact Designer for clarification or confirmation of particular queries or problems. All the Builders stated if they did have queries they either overcame the difficulties themselves or asked advice from the Building Control Officer.

Builders regularly come across drawing errors and often had to overcome the resulting problems. Also, they regarded changes in construction instigated by clients as mainly cosmetic in nature whereas Designers negligence and mistakes had more profound effects. There were criticisms regarding the unwarranted use of Structural Engineers for minor construction components which led to needless additional costs and Builders felt pressurised by customers to cut back on these unnecessary items and make savings. Inaccuracies and omissions in the contract documentation were reasons for delays and extra costs with consequent reductions in profit. By this means achieving compliance was accomplished through interaction, advice, expertise, and research. The accumulation of these actions resulted in extra resource allocation on the part of the Builder as well as the Regulatory Authority. This confirms the work undertaken by Riemer (1976, p.258) which identified mistakes on site and the management of them by skilled tradesmen which he argues are mostly predictable and manageable.

Building Control Officers

The Builders, without exception, perceived they had a commendable working association with the local Inspectors and the Building Control departments in general. Three of them reinforced their comments stating they thought their relations were excellent, and they had no problems with the regulators. It may be argued that the interviewees were trying to present an agreeable face and ingratiate the researcher. However, this should be contested forthwith, for not only were they assured of anonymity but the

interview provided ample opportunity throughout its course to express any grievances they might find with the regulatory system and its operators.

Builders agreed, except in one case, when asked if Building Control was easy to contact, concurring that in their particular location it was. Certainly two respondents were very complimentary about the efficiency of communication between them and the inspectorate. Although the question was only broached in four of the case studies concerning the professionalism and competence of the Building Control service, there were no adverse comments. Builders thought the system was “good,” “works well,” and “no problems.” Two Builders offered suggestions to how the service might be improved “keep it local,” and “could inspect on a more regular basis.” The remainder of the respondents could not think of any necessary improvements or refinements to the existing procedures and service, “if it’s not broken don’t fix it,” being a representative stance.

6.13 Builders’ Views Analysis

Personal building surveys carried out at each extension revealed all projects were in conformity with the substantive requirements of the current Building Regulations. There was some variation in the standard of workmanship and materials, but these were not issues relevant to achieving compliance with the building codes applicable at the time of construction. No unsettled shortcomings remained, and all works were considered to be in proper condition, nor were there any outstanding enforcement actions or disputes arising from the regulators. It should be emphasised that what is acceptable to achieve compliance with the substantive requirements of the Building Regulations is not the same as discrepancies and disputes with quality issues that often arise in new works. Somerville and McCosh (2006) from their survey of 1696 new houses found 389 snags in one single property, but these types of results cannot be regarded as problems that would lead to additional regulatory resource use because these were not contraventions of the Building codes. No Home Owners complained specifically about the

completed works on their extensions, from the results of the interviews all were satisfied with the finished product.

All Builders had sufficient turnover to be registered for VAT; there were no single operative companies using subcontract labour only. The size and experience of the contractors involved were diverse, from a two-man enterprise ranging to organisations retaining up to fifty or more operatives. In the context of these minor works it is advisable to define the terminology of contractors staffing capacities. For example, a large employer in the minor works category is one that might otherwise be identified as a medium size firm in general construction terms. Based on turnover Akintoye and Fitzgerald (2000) classify contractors as very small, small, medium, and large. The biggest construction company in the UK employs 12,000 personnel, and only just over one hundred companies employ over a thousand people. The vast majority of the 194,000 companies engaged in the industry are quite small (Department of Business Innovation and Skills, 2013). This is an advantage in small building projects as Hardie and Manley (2008, pp.9-10) found 'the inbuilt flexibility of small businesses can be one of its most effective assets.' The Builder involved in the project with the greatest amount of inspections employed approximately thirty persons, a medium size employer within minor works category of construction. The Builders that had ten or fewer artisans in two of the districts that broke even on fee income and Building Control inspected within the programmed regime. The other extension undertaken by a very small company made a resource loss for Building Control but the extra inspection incurred by the inspectorate was not the fault of the contractor. Two Home Owners' expressed anxiety or concerns about the operatives on site, and these were employed by companies that had fifty and fifteen workers respectively. Soetanto et al. (2001) generally found clients were more satisfied with contractor than Architects performance but still believed that contractors needed to improve their performance. The present research confirms their notion but highlights that it is Builders who overcomes problems on site.

It proved impracticable to construct a matrix of 'comparative experience' of tradesmen employed on site due to the difficulty in locating and interviewing so many individual operatives. Suffice to say that only in the project constructed by the two-man company could overall experience be classified as constrained, primarily due the limited period they had been trading. At the time of the research their work was considered satisfactory by both the Home Owner and the inspectorate. These findings do not accord with the Australian experience of a skill shortage due to demographic changes in the working population (Karmel and Ong 2009, p.2445) Though there are similar ageing population problems in the UK as Australia, skill shortages have not materialised as a matter in this research. None the less a similar study in Canada by Pyper (2008) reiterates the difficulties associated with an aging workforce. Reduction in construction workloads, the laying off of tradesmen, and the free movement of skilled operatives from Eastern Europe have been factors in alleviating such drawbacks in the UK. The cash in hand economy has grown in the past thirty years claim Erlich and Grabelsky (2005, pp.424-426) partly through the decline in union membership and a drop in real term wages. Other research has found that there are high attrition rates by qualified workers from their trade (e.g. Webster et al. 2001). These agents have had an influence on the major construction part of the market. The very small and small companies involved in the case study projects have not been affected to such a degree.

Designers can estimate costs of their projects and provide Home Owners with these figures prior to contract appointments, so they have an idea of contract prices before they obtain Builders' quotations. The present findings suggest that in the small works field the best, and most experienced tradesmen have remained in the industry whilst other workers have moved out. For example, the five and ten person enterprise had been in business over twenty years employing the same operatives for a considerable part of that time, the fifteen man company slightly longer being a father and son establishment. The two largest (medium size) firms had both been founded over fifty years. All operatives commanded the appropriate skills required

and were qualified in their own particular trades. However, the business acumen that forms part of a Builders ethos also plays a role in the winning of contracts.

Builders confirmed that interaction between regulators and regulatees was bounded by professional ethics and their wish to subscribe to an ethical code. These findings accord with the results of Vee and Skitmore (2003, p.117) concerning professional ethical issues in the construction industry where most (84 percent) thought that business ethics should be governed or driven by personal ethics. It was apparent there was a continuing and ongoing dialogue between Builders and Building Control Officers during the construction processes. When complications arose they were identified and rectified as work continued and questions concerning potential problems were answered, though not always immediately. Work schedules were discussed in advance with possible difficulties or unusual situations and conditions pointed out. Where works were in nonconformity or there were potential breaches of the codes these issues were discussed and remedial action agreed. The finding of Slaughter (1993, p.544) coincides with this mode of operation when she discovered that innovation is more likely to occur on site than elsewhere. In most instances actual or potential infringements of the codes did not entail extra site visits, the quandaries and problems were usually dealt with there and then. Future inspections of remedial were noted and scheduled primarily to take place in combination with the subsequent programmed visits. The majority of construction quandaries and problems that arose from Builders concerned not just regulatory problems but a variety of other difficulties which were dealt with by the inspectorate as works progressed but did not contribute to any significant degree to extra resource use. In many ways this routine is historical rather than perfunctory; it is a way of functioning that is mutually beneficial to both parties. A bureaucratic versus craft administration issue took place in the past, and Eccles (1981, p.451) argues but a healthier relationship of cooperation and collaboration between regulators and regulatees has since developed.

Three projects with the lowest amount of visits averaged were carried out by companies with ten or fewer operatives. Firms with fifteen to fifty employees did far worse averaging ten inspections. However, averaging inspections out on such a small sample is both inaccurate and misleading for it disregards other factors that might influence outcomes and does not fit the notion of replication. The lack of constant variables, such as on-site construction problems or workers skill levels means this study cannot draw any meaningful conclusion for claims that the size of Builders' enterprises alone influences the number of additional inspections demanded and consequent extra resource allocation. The research did not reveal any ineffectiveness by Builders themselves that led to further resource use. Therefore, issues concerning their efficiency and work methods did not arise. However, enhancement of skills and upgrading communication abilities has been viewed by Koehn and Caplan (1987) as areas that could lead to work betterments. These may provide improvements in productivity which could prove beneficial but would not necessarily lead to a reduction specifically in Building Control resource overruns.

Builders have had a bad press, and the poor perception of their skills and attitudes runs deep amongst the general population and to an extent within the construction industry. This research failed to locate any instances of inadequate construction works resulting in contraventions of the Building Regulations. This factor ran true for all Builders regardless of their companies' size or their technical experience.

Summarising the analysis, variation in the size and experience of contractors made no difference to the consistency of ethical standards. Builders were not the cause of any of the problems associated with additional resource use. They maintained a good relationship with the inspectorate. Criticism of Designers, in general, was substantial, particularly regarding drawings and specifications. Builders were reluctant to talk about Home Owners except in a general

way, but their relationships varied depending on the personality traits of the parties.

6.14 *Social* Building Control Officers' Views

The researcher in the course of employment in Local Authority Building Control since 1987 has had the opportunity to encounter many Building Control Officers. Therefore, it cannot be disputed that a conviction was already generated of what the responses from the inspectorate would tend to be. Immersed in practice culture there will always be grounds for criticism regarding objectivity. The questioning explored deeper than would normally be the case in the informal interaction between regulators and concerns about influence and impartiality were taken extremely seriously.

Home Owners

Very little contact time was spent with Home Owners regarding either the application or during the construction processes. In four of the cases, the regulator never met the client and saw only the Builders during site visits. Frequently the only contact with Home Owners was during the completion inspection and that is not always the case. The majority of Home Owners were at work during business hours. Building Control Officers felt that mainly clients had a limited knowledge of construction and were "content to let the professionals get on with the job."

Designers

Officers stated that they had no interaction with any Designers during building works. Any contact time was at the plan checking stage, two Building Control Officers confirmed they spoke to the Designers involved the remainder had no recollection and said: "it would have been by e-mail if at all," or "only through standard correspondence." Five of the regulatees knew the Designers and had dealings with them over some years. It is quite commonplace for small residential projects to employ local Designers and the inspectorate has business associations with this group quite regularly.

Regulators also mentioned that Designers came into the office for preliminary discussions or to attend Local Authority seminars; Designers who had been operating locally for some while became well known and built up relationships with the staff of the Inspectorate. Exceptions to this situation were new Designers recently setting up practice, applications from Designers in practice out of the district, or operating some distance from the Building Control offices.

Builders

All the contracting firms and most of the operatives on site were known to the inspectorate. They had dealt with the firms on numerous occasions except in one case and on that project they knew the contractors previously when they were employed by another company. Relations were informal between them and the Builders, and there was considerable trust, rapport, and identification on both sides in their interactions with each other. This harmonious situation is distinct from the sometimes held view of combativeness.

6.15 Building Control Officers' Views Analysis

The documentation maintained by the respective Building Control bodies provided data for details and issues faced on site for each respective extension. The documents also contained the records of the plan checking operations and ensuing correspondence with relevant parties. The interviews provided information and opinions from the other actors involved towards the Building Control Officers administering the project as well as from the inspectors directly themselves.

All Building Control Officers interviewed were members of a professional body and except for one officer had, at least, ten years experience and considerably more in most cases. This refutes the assertion made by Gummer (2006, p. 37) who claimed Building Control Officers have no formal training hinting that membership of a professional body is only obtained

through in-house development. One manager stated that approaching half of all Building Control Officers nationally are over fifty years old. This is reflected in the small numbers of new entrants into the profession due to the downturn in construction and the sparse numbers of retirees because of the linkage of the pension scheme age to the increased state retirement age (Communities and Local Government, 2014). The competence of Building Control Officers to do their job is reflected by their membership of the professional bodies such as RICS and/or the CABE and sometimes the CIOB.

The influence on resource allocation by the differing attitudes of Inspectors was refuted by May and Wood (2003, pp.128-129) who failed to find a direct affect of enforcement styles on compliance and was reinforced by the interviews with regulatee participants. For example, Builders were in unison regarding their complimentary and sometimes enthusiastic attitude towards the regulators. The evidence provided by the interviews is there is often a strong professional or personal relationship built up over some years. Critics might counter-argue that this closeness could lead to conflicts of interest or favouritism resulting in substandard work; this should be refuted because the possibility of overlooked defects arising, later on, could lead to litigation and legal claims by Home Owners or subsequent occupiers. The integrity of the Building Control Officers' responses may be disputed because they could be giving replies they perceive the researcher wishes to hear. This suspicion must be rejected too because the interviews correlate substantially with those of the Builders confirming there is generally a benevolent and cooperative relationship between regulators and regulatees. Indeed, Baker (2013, pp.10-11) suggests Builders relationship with Building Control is remarkable compared with other industries and their governing bodies. Again his conclusions might lead to allegations of a cosiness or even corruption between parties who have built up association over a period of some years. No hint of dishonesty or intrigue was revealed by this research, and there is a paucity regarding this subject in the literature, what little is available overwhelmingly concerns public sector administration

overseas. Analysis by Escaleras et al. (2007, pp.211-213) for example proves there is a relationship between building inspectors' corruption and deaths by collapsed structures in other countries; no such research has been undertaken in the UK probably because no such incidences have occurred.

Home Owners lacked face to face contact with the Building Control Officers in most cases and did not have an opportunity to establish a relationship. However, they did respect them for their technical ability and clients were gratified of their fairness and efficiency refuting the pronouncements of Gummer (2006, p.37) mentioned above. The reasonableness of the various inspectors came across as a strong attribute especially in contrast to some Home Owners perception of a number of Planning officials. Scott (2012, p.109) argues the building industry requires assistance from Local Authorities and advocates making a link between Building Control and the Planning process. The public's impression of the nature of Local Authorities' officials as being bureaucratic was refuted by the interviewees concerning Building Control Officers and supported by the literature (e.g. Baker, 2013). This difference in attitude has been attributed to the changes in the regulations made in 1985 and the advent of competition (Sansom, 2012, pp.10-11). The level of individual expertise is much greater than in the past, and the requirement for all regulatory staff to be professionally qualified has meant a more effective approach has materialised. A more objective attitude on the part of the inspectorate distinct from the reliance on subjective decisions arrived at by other departments such as Planning has been achieved because primarily regulatory issues involve technical decisions. There has been criticism that there are poor levels of compliance on completed projects that have been given a completion certificate, especially concerning the energy efficiency regulations (Pan and Garmston, 2012). The granting of completion certificates is based on the technical decisions of the Building Control Officers. The building surveys undertaken on each project did not support this analysis as all extensions were found to be in conformity. In contrast, there has been criticism of strict enforcement

standards by the inspectorate increasing the cost of construction (Burby et al. 2000) a phenomenon not encountered either in this inquiry for it revealed that Building Control Officers engage and operate a middle way between these two opposing assertions.

Designers had an intermediary relationship with the inspectorate positioned between Home Owners and Builders, being more perfunctory as most interaction took place by telephone, mail, or electronically with the occasional face to face site or preliminary application meeting. The service provided by individual Officers is thought to have improved substantially over the years. Information technology has made communication more expeditious and easier though this has not been without problems. For example Chmielewski et al. (2010, p.33) draw attention to major concerns in the use of mobile interfaces for Building Control Officers in out of office operations and the integration of heterogeneous front-end platforms. These types of developments and the prevailing client friendly attitudes of individual officers are regarded by Designers as an acknowledgeable improvement over past conditions. This attitude may be founded not only on the new professionalism of the staff but due to changes relating to the exposure to competition from the private sector. Hawkesworth and Imrie (2009) recognise the organisational changes and attitudes in Local Authority Building Control but in their evaluation warn that actual public provision of Building Control may be undermined.

Any interaction Designers had with Building Control Officers ceased once plans had been approved and regulators negotiated directly with the Builders regarding problems found on site. Plan checking operations conducted by surveyors worked to the satisfaction of Designers and from that perspective they were satisfied with the efficiency and inputs of the inspectorate. Building Control Officers were highly regarded by most actors involved in the domestic extensions researched. This is welcome news for the inspectorate as the Swedish model of public administration has been advocated as an example to emulate. The high degree of openness and

autonomy on the part of the regulator as outlined by Levin (2009, p.38) goes some way to meet this demand. However, the present system lacks the decentralization of political authority he describes.

In summary, no evidence was discovered to support the assumption that variances in resource allocation to achieve regulatory compliance is caused by any discrepancies in the levels of professional expertise or capability on the part of the inspectorate. There is no discernable difference in the professionalism and skills of the Building Control Officers involved in the researched projects. There were slight age and attitude variations, but no correlation was found between these factors and extra resource use. Neither was any evidence produced to demonstrate that some Building Control Officers were stricter than others in their enforcement standards. There is a high degree of mutual respect between the regulators and Builders. Little contact time was spent with Home Owners. Designers were often well known to Surveyors, but it was exceedingly rare for any interaction between them to take place on site. There was no evidence to indicate that Building Control Officers' personal actions or attitudes affect departmental resource over-runs.

6.16 Views *Technical Complications*

Save but one of the case studies no technical complications induced a delay or postponement in construction work warranting a supplementary site visit which had an influence on the amount of extra economic resource allocation used.

The participants interviewed were requested to provide an opinion on the various difficulties and predicaments that had or might occur on site. The first interviewees in each case study were the Home Owners who were often unaware of specific problems that took place on their property. They were not always informed or participatory to technical complications that arose but

enough intelligence filtered down to them to permit the interviewer to gain sufficient knowledge to appreciate the challenges that developed. One Home Owner was quite distraught about the problems that had occurred on her project “the existing drains were running along the site of the proposed foundations”, “there were lots of mistakes that came to light,” and “huge amount of time and money spent on unforeseen problems.” “The internal wall had to be demolished as it turned out to be non-load bearing,” are instances where technical complications concerning concealed elemental problems could not have reasonably foreseen without a pre-construction investigation taking place.

One project had no technical complications, and no additional resources were used by Building Control, progress was satisfactory though the Home Owner was at odds with his original Designer. The remainder of cases experienced some form of technical problems at various stages during their construction. Problems revealed by the Builders or Building Control Officers to the researcher were often never realised or noted by the Home Owners. For example, on one undertaking two technical difficulties developed but the Home Owner’s comment was “It all went in a straightforward way, we didn’t have any problems.” This view was partially reinforced by another Home Owner whose Builder experienced a number of difficulties that caused Building Control to engage in additional inspections. “Building Control knows the Builder very well he is not going to take any shortcuts.” Two of these issues the Designer could have resolved before application for Building Regulations and should not have arisen in the first place. The Home Owner’s perception was correct in trusting his contractor, “our relationship developed from earlier work ten years ago.”

In one case only was a technical problem detected by the inspectorate, all others were brought to the attention of the Building Control Officer by the contractors on site. In this case, an insulation check on the existing property revealed a Designer’s mistake in assuming the thermal calculations for the existing house. The problem was rectified by the Builder but when brought

to the Home Owner's attention the Building Control Officer was accused of being overzealous, "the amount of insulation (required) was absolutely phenomenal." This highlights the paucity in Home Owners' awareness of extra site visit entailed by the inspectorate through these types of problems even though they might be avoided by good design practice. Home Owners, in general, seem to be satisfied with the reports and feedback they receive from their Builders, for example, it was declared "it's nice to know somebody is there and the foundations are deep enough." Due to their very nature concealed technical complications are usually first encountered by Builders, discussed with the Building Control Officers and rectified without Home Owners' knowledge or appreciating the extra resource allocation involved.

Designers had extremely limited knowledge of what happened on a project because they never undertook site supervision. From the archival retrieval except for rare communication from Builders querying particular issues or Home Owners complaining, their contribution ceased once their application had been granted approval. For this reason, so few mistakes or omissions in Designers' original surveys ever came to their notice. This raises a critical point as they have limited comprehension how much resource allocation was used rectifying unexpected technical problems. A typical comment expresses Designers' views succinctly "if private people have a Designer they have a reasonable standard because a lot of people haven't any idea." This particular case resulted in covered elemental conditions being noted immediately on site and overcome jointly by the regulator and regulatee. The Designer produced reputable drawings but was oblivious to his failure on specific foundation details which if he had properly surveyed the project would have prevented the problem occurring. In another case regarding thermal regulations, the Designer claimed: "that is an overcomplicated way to achieve a standard," and was the only example in this context of any slight tension between Designers and Building Control. The interviews demonstrated that Designers rarely had knowledge of what happened on site after their drawings had been approved. "I have no idea if it was who I think it was, everything would be alright." An approach which reflects the

attitude that as long as the Building Regulations application is approved, then the Designers' responsibility is accomplished.

When there was mention of specific problems associated with physical conditions on site which are unexposed, a typical reply was "They have their own dynamic in the environment and they have to be dealt with" (as they happen). A response that dispensed liability from Designers and shifted responsibility to actors involved in the construction. "Probably the biggest cause of alterations is the Home Owners misapprehension of what they are getting," sums up another Designer's view. Appreciation that hidden elements were a problem was admitted "unforeseen things, ground conditions, working on older buildings you find inherent problems in the building." Designers are apprehensive about undertaking thorough, perhaps expensive, preliminary surveys to discover potential concealed difficulties. "I have got a standard spec which I have been using since 1984," or "My standard construction notes are about twelve pages you can go through that to fit each particular job" illustrates that on small projects Designers are primarily concerned about obtaining Planning and Building Regulations approval. Commenting on a rival Designer one said: "one guy has a standard rider on his plans, and it says all work will comply with the Building Regs and all materials conform to the BS." A statement which highlights the speed at which Designers often produce work with little time to investigate comprehensively concealed elements or potential technical complications during their preliminary surveys.

Builders during construction are the actors who usually encounter these issues first. Participants indicated "I don't get a lot of problems on any job if I do I talk to the BCO, I don't rush on and do it," but mentioned they quite regularly came across mistakes on Designers' surveys or drawings. Another Builder was reluctant to discuss a project in detail because of some friction with the client and acknowledged his operatives had uncovered hidden problems but accepted that this was par for the course. A typical technical complication is the inadequacy of the ground bearing capacity of proposed

foundations a factor difficult to assess without digging preliminary trial pits, which in turn would have pre-application cost implications. Designers' specifications overcome this eventuality by stating the ground bearing requirements and leave the actual capacity to be discovered. This is not always a contentious issue for Builders as they may be reimbursed for the extra work but could necessitate additional inspections for the regulator.

Builders usually overcome unexpected technical complications and negotiate any extra charges directly with Home Owners. In district three the Builder discovered concealed elements, which should have been in the drawing and was reimbursed for the supplementary works without difficulty, but stated: "I would rather work with a drawing," even though due to the uncovered works the plans were of little practical value. In district four the Builder found a couple of technical problems that caused delay, "yes we had to have extra inspections due to the retaining wall and foul drain." The Builders were paid for the additional work which increased the price of the job for the Home Owner, but the work on that project did not generate additional visits for Building Control; because the problems were discussed during preceding inspections.

In district six, for example, the gradient of the ground necessitated stepped foundations. The Builder overcame this difficulty, but he was more concerned about the Home Owner's alterations "Home Owner's change their minds; people don't know you price a job to a certain specification." What he was acutely aware of was the irritation that occurs when additional work clients require and have no Designers' authorization for changes (Architects Instructions) and for which it proved difficult to receive reimbursement.

Building Control Officers can be affected by on-site problems not just by additional inspections but by the need to research, undertake extra calculation checks, and the additional time spent in the office. In district one there were two concealed elements, one could have been obviated by the

Designer, and the other only reasonably detected during construction operations. The Building Control Officer interviewed, in this case, was the Manager, who had no first-hand knowledge of this project and relied on his subordinates file notes. His opinion was that these unexpected problems have to be dealt with as and when, “take the rough with the smooth.” In district two the project had no technical complications and a similar reply was received “everything was OK with the job,” hinting that the questioning was hypothetical.

In district three the technical complication was dismissed by the Building Control Officer “as nothing untoward.” He had visited site, ascertained the unexpected foundation problem encountered and said: “we issue a site inspection log and on that log we tick the box (for the element) we want to see.” He returned for a supplementary visit a few days later. In another district, the interviewee thought, “it was a small extension there was a reasonable amount of inspections (four) sufficient for the work.” The unexpected below ground problems were dealt with by use of previous site inspection time being used for discussion between the Builder and the Building Control Officer.

The inadequacy of the thermal insulation within an existing property was discovered by the Building Control Officer, who had works uncovered which revealed the actual insulation present rather than that assumed and stated by the Designer. This resulted in an additional re-inspection to check the remedial works but the Building Control Officer, in this instance, like his colleagues elsewhere was blasé about its resource impact and implications. “The regulations change so fast it’s hard enough for us to keep up with it.” In district six the additional inspections were necessary due to a foundation redesign, “the extra inspections were for the ground conditions, but we did two on the same day twice that is eight inspections but only six trips out.” A reply which demonstrated that by good time management it was possible to contain additional inspections within budget.

6.17 Technical Complications Analysis

The documentation and archive retrieval underscored the problem of technical complications more so than the interview transcriptions though there was a correlation regarding this subject between the interviews and the regulators' site notes. The technical complications revealed by the research as a cause of resource overruns demonstrated that this phenomenon is easily overlooked, but these occurrences in retrospect often seem quite obvious. Actors situationally close or involved in certain environments do not always possess the objectivity they think they command or the breadth cognizance they perceive they enjoy.

Concealed elements, particularly in the subterranean environment, were the greatest single reason for technical complications. Existing foundations, substrata structures, drains, and ground bearing capacity were the most common problems encountered. This is reflected within the wider construction industry as a primary source of delay or suspension of work. Chan and Kumaraswamy (1996, p.569) identified 83 delay factors affecting resource use, although there was disagreement among actors in the ranking of these factors, underground problems emerged as a substantial element in the equation. These findings were reinforced by the work undertaken by Baldwin et al. (1971) who also established unexpected foundation conditions were an important reason for delay. Carmona (2009, pp.2643-2667) in his research on design coding draws attention to the roles and relationships between different stakeholders, 'from the data collection it was apparent that there was a dichotomy between creativity, regulatory modes of praxis and market forces creating a work situation where the possibility of contention could arise'. In trying to determine the eventuality of concealed elements materializing it was a more comfortable position for actors to focus on their own tasks and inputs whilst failing to anticipate the possibility of encountering future problems.

The first professionals to visit the projects were the Designers who should have been alert to potential hidden complications when they undertook their initial surveys. The Inspectorate was unaware of these possible technical complications at the plan checking stage because the drawings were approved for the written conformity with the building codes. On-site problems of this nature were mainly revealed by the Builders as works progressed and rarely by Building Control. Builders in some cases could have taken the opportunity, at the commencement stage, to consider potential problem issues and contribute to the alleviation of extra resource use even if the cause of the complications were due to Designers' shortcomings.

'Buildings emerge out of the context of accumulated mistakes' writes Reimer (1976, p.258) and he identified that one such cause comes from the transitional nature of the work settings. It is axiomatic that if new construction works as he claims are permeated with hidden and future problems any additions to older buildings will potentially uncover unanticipated difficulties. The present research revealed prior to engagement all Builders were unacquainted with the properties to be extended and only obtained an understanding and familiarity with the buildings' structural composition after their appointment. Home Owners knew their individual properties in a personal rather than a constructional way but the professional actors were familiar with the locations and areas in which they operated and had previous experience with similar projects. Given the accumulated skill and knowledge of the parties involved at least of some of the hidden problems and technical complications could have been foreseen and predicted.

Technical complications were a cause of resource overruns for Building Control bodies. It would be reasonable to suppose they would have been anticipated before commencement of the projects but were mostly dealt with by the regulators when discovered and as work proceeded. True unforeseen technical complications also occurred,

but these problems did not and practically could not be anticipated, and therefore, responsibility could not be charged to any one individual.

6.18 Cross Case Developing Issues

Except for technical complications experienced the data generated no other propositions regarding excessive resource allocation other than those postulated at the commencement of the research. This was rather disappointing as it was hoped that some new categories might emerge from the study. However, endeavouring to explore widely why resource use overruns occur advantage was taken at the interview stage to question participants concerning their views on ancillary matters that might have an influence on this situation. This opportunity illuminated some other factors and activities upon which participants did possess opinions and views, though not all related to additional resource use but they could have proved helpful in bringing subsidiary improvements to the service. The notion that there could be amelioration in domestic extension resource use through measures which themselves might not be the cause of extra site inspections has been of little of value. Whilst these interviews were in progress a number alternative ideas and suggestions arose which may prove worthy of further exploration. Three have been included here as they parallel the quantitative data with relevance to resource overruns whilst four other ancillary issues have been incorporated in the Appendices 9-12.

Private-public

Home Owners favoured an independent service to ensure that the requirements of the relevant building codes were met, and there was a lack of appreciation of the alternative to Local Authority Building Control. Clients who had extensions built relied on their Designers to designate the type of regulatory service provided. Interviewees often seemed surprised to hear there was an alternative provider stating that their “Designer never told me that,” or “I only recently appreciated you can use an Approved Inspector.”

Failure on the part of their Designers to inform Home Owners about independent control was not a contentious issue with them. The reason for this, discounting cost, was they did not perceive any difference in effectiveness between private and public inspection. Competition between different regimes can influence fee prices but as distinctions in fee scales are, according to all participants, a marginal influence on overall budgetary costs price was not a powerful determinant of the choice of regulator.

Designers were the most likely agents to choose whether the Building Control function should be undertaken by the private or public sector. Four of the Designers interviewed believed that the arrival of competition in the form of Approved Inspectors was a good thing. Two held a contrary opinion and never wished to use private Building Control one professed “I have no experience of them,” the other stated, “not as a matter of choice, everything I do is Local Authority Building Control.” A solitary Designer was overtly enthusiastic about Approved Inspectors declaring “we use Carillon and they are brilliant.” The use of Approved Inspectors was reserved for “only for large Projects,” or “generally on commercial work.” This occasional use of the private sector was supported by another Designer who testified “we do (use them sometimes) but prefer Local Authority Building Control.”

Builders rarely have an input into this decision-making process as they are usually engaged by the Home Owner after plans have been drawn providing little opportunity for them to state a preference. In one case a Builder was unaware of an alternative to Local Authority Building Control. Another thought they were a good thing whilst two Builders had no problem with private Building Control. When asked if they would choose an Approved Inspector in preference to Local Authority one responded he “often used the private sector,” whilst one said he did “occasionally,” and a third confirmed he had no experience of Approved Inspector. The remaining Builders thought it was the client’s or Designer’s responsibility for the engaging Building Control, overall a strong preference for Local Authority Control was expressed.

When questioned about their views of Approved Inspectors one *Building Control Officer* thought their introduction had been a bad idea. The remainder respondents were positive about competition and declared it had been a useful thing. Some added they regarded the playing field as unlevel, and competition was not entirely fair or equitable. The amount of domestic extension work Approved Inspectors gained from Local Authority Building Control may provide insight about any influence the type of regulator may have on any excessive resource allocation of a particular project. Questioned about the proportion of the domestic extension market the private sector occupied answers revealed that the majority of this type of construction work was firmly in the hands of the public sector. Only one regulator was unsure of the percentage of work won from the Local Authority. However, from the documentation held by the various Authorities, eighteen percent was the greatest amount of domestic extension work obtained by the private sector the volume reducing substantially for the remainder of the Authorities. One body had lost only twelve domestic extension projects in a year and in the interviews others stated the figures for private sector control were “not much,” or “insignificant.” Local Authority Building Control retained a high share of the domestic extension market, and the small inroad the private sector had made demonstrates the restrictive margins for potential profits in this field. In contrast, the private sector has gained an impressive share of the commercial and volume house building work.

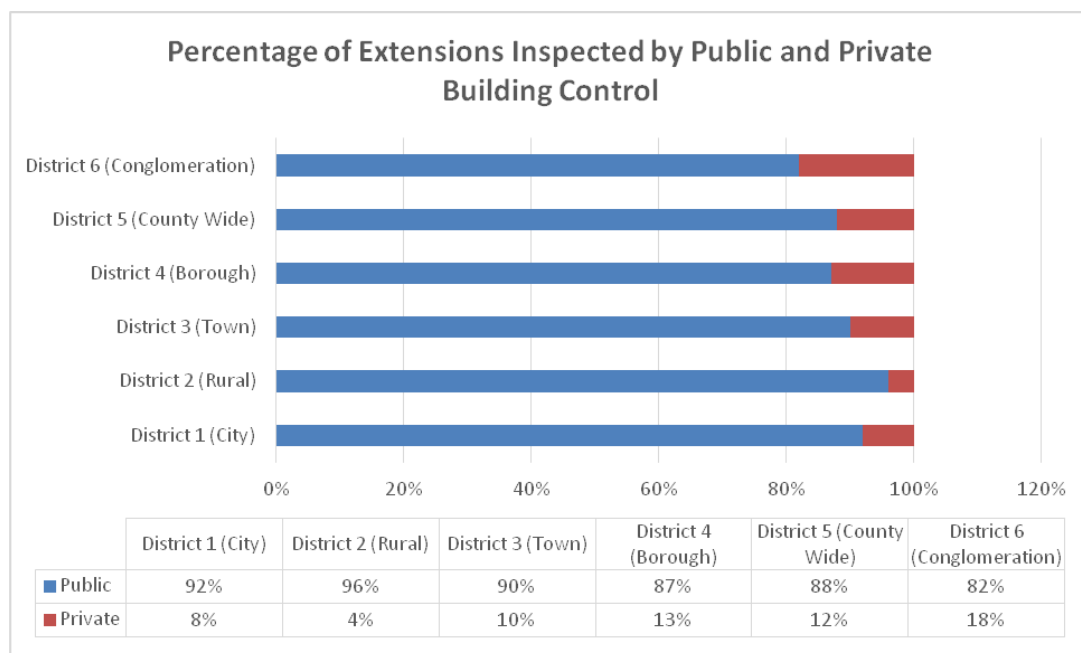


Figure 15: Extensions inspected.

In summary, there was a consensus of opinion that an independent inspectorate was the best means of ensuring the Building Codes were adhered to and enforced if necessary. It was a matter of personal choice which sector of Building Control was chosen though the public one maintained the dominant share of projects in the domestic extension category of construction work. The division of independent responsibility between the private and public regulators may mean compliance is not achieved uniformly and is an area worthy of further research. However, additional resource use could only be influenced by the public versus private debate if Local Authority Building Control was found to be adjusting fee scales to win work in competition from Approved Inspectors. Therefore, the issue is developed further in 7.4 in the context of competition between the two types of Building Control.

Fee setting

The problem of disproportionate financial resource allocation in domestic extensions in comparison with other projects is the rationale for this research. Only *Building Control Officers* were interviewed regarding fee setting, and their replies confirmed the notion that this is an ongoing

dilemma and reinforces the views held by Building Control Officers questioned in the pilot study (4.3 Table 1.). Setting fees at the correct level was highlighted as a problem because “some persons call you to inspect each nail, others hardly call at all.” “Domestic extensions are expensive in comparison with other types of work,” because even for the smallest project there are five statutory inspections to undertake. “Domestic extensions don’t actually cover the fees,” claimed another respondent reinforcing the difficulty of complying with the regulation which a later interviewee maintained “requires Local Authority not to make a profit or loss.”

The fees in one area were based according to one Building Control Officer on “the hourly rate and how long they thought a job might last.” This cannot be an accurate assumption as the fee scales for domestic extensions are set and published and so what the respondent insinuated was that fees were set for each project. In fact, another surveyor was adamant that the fees in his area were “based on what is published by the government”, probably implying that they were based on national guidelines. A contrary reply that “Inspections of other nearby jobs can compensate in time and money,” an admission to a form of cross subsidisation. The same respondent reinforced this view, “the benefits of the economies of scale, we don’t have a large rural area to cover, a BCO can walk down a few streets and can visit a number of jobs, five or six inspections,” suggesting that the costings of a number of projects could be grouped together

Building Control Officers were asked if they truly exercised the power to set their own fee scale or whether the Local Authorities’ executive influenced or pressurised Building Control units to conform to a central economic policy. A single surveyor had no overall appreciation of the situation in his particular location; others were more knowledgeable. They recognised that they had to go before a finance committee who ultimately granted their departments the authority to determine the fees. “We adhere strictly to the central Government’s guidelines” stated one inspector; which left his finance department with little room to manoeuvre in requesting an adjustment to any

proposed fee scale. "There is always pressure on the budget," claimed another highlighting the point in some Building Control units that if a profit of more than five percent is made, "there is a danger we would be charged more for support services," by the Authorities' finance department. This conviction was reinforced by others who admitted there was interdepartmental cross subsidy already, "we would get a better deal if our financial services were outsourced," "It is difficult, so you set a fee that is open-ended," confirmed the third interviewee. The larger the unit, the more command they appeared to exercise over their own fee setting, "because we are arms length we charge a sensible price," and "Within the partnership we have a bit more control than other Local Authorities."

Differences in professional actors' and Home Owners' attitudes affect the number of site-visits undertaken. Authorities have to make a reasoned judgement based on the number of statutory inspections required by law and the probable request for visits from the regulatees. There was no evidence provided by any participant to empirically contest that fees were set incorrectly and therefore contributed to resource use overruns.

Delays on site

Problems and delays on site can be caused by many factors (e.g. Baldwin et al. 1971). *Labour shortages, inclement weather, and equipment failure* should not affect the regulators' resource use because inspectors would not be called out due to delays caused by these types of problems. However, Building Control bodies do use additional resource use when the inspectorate is requested to visit because of *construction mistakes* whether on the part of the Builders or Designers that requires rectification procedures. Material shortages leading to a *change of components* and *manufactured items* without the relevant standards are further examples where there could be a demand for Building Control to have an input. These type of problems can often be dealt with off-site and obviate the greater economic resource use brought about by travelling to and inspecting the

project. *Sample approvals* are a further potential cause of extra resource use unless endorsement can be carried out in the office. Alternatively, if a site visit is necessary and organised correctly it can be combined with a statutory programmed inspection. Queries regarding the *building codes* can usually be dealt with in the office or during routine inspections; occasionally an urgent inquiry will require a site visit. The small scale nature of domestic extension projects means that some of the concerns raised above are not entirely applicable. For example sample approvals or material shortages rarely occur as most extensions use components readily available at local builders merchants. The issues outlined by Baldwin et al. (1971) have been well known within the industry for many years and should be routinely acknowledged by the regulators in their everyday practices in assisting extra resource use be kept to a minimum.

No evidence of any nature was found that delays on site contributed to additional resource use by Building Control.

The tables and figures set out below achieve objective 2 (1.4).

6.19 Summary of Case Studies of Problems and Details

District	No. of Visits	Building Control Problems	Other Problems	External Causes	Building Regulations Causes	Home Owner Causes	Designer Causes	Fees (£)	Loss or Broke Even
1 (City)	16	4	0	0	0	1	3	510	Loss
2 (Rural)	5	0	4	4	0	0	0	514	Broke Even
3 (Town)	6	2	0	0	0	0	2	590	Loss
4 (Borough)	4	4	0	0	0	0	4	633	Broke Even
5 (County Wide)	8	3	0	0	0	1	2	429	Loss
6 (Conglomeration)	8	1	2	2	0	0	1	690	Broke Even
Total	47	14	6	7	0	2	12	3866	n/a
Average	8	2.33	1	1.17	0	0.33	2	561	50/50

Table 5: Summary of Problems

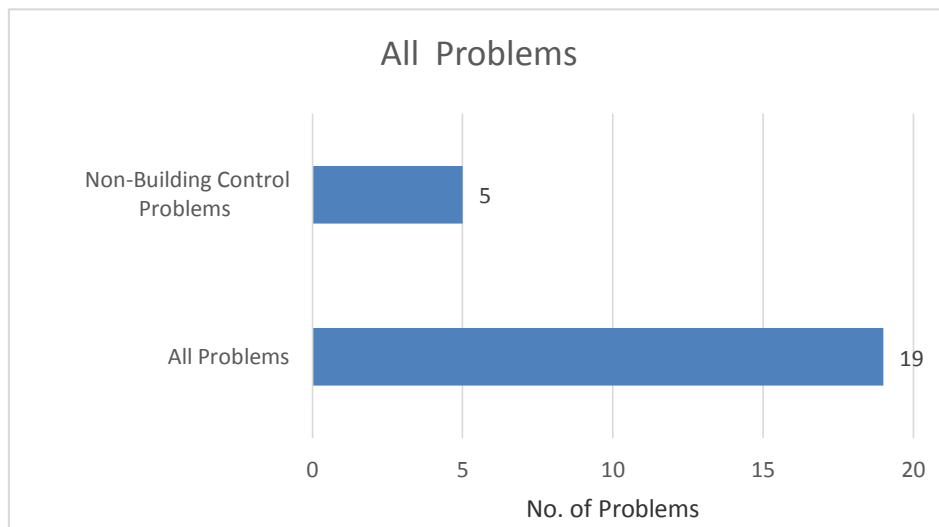


Figure 16: Number of Site Problems

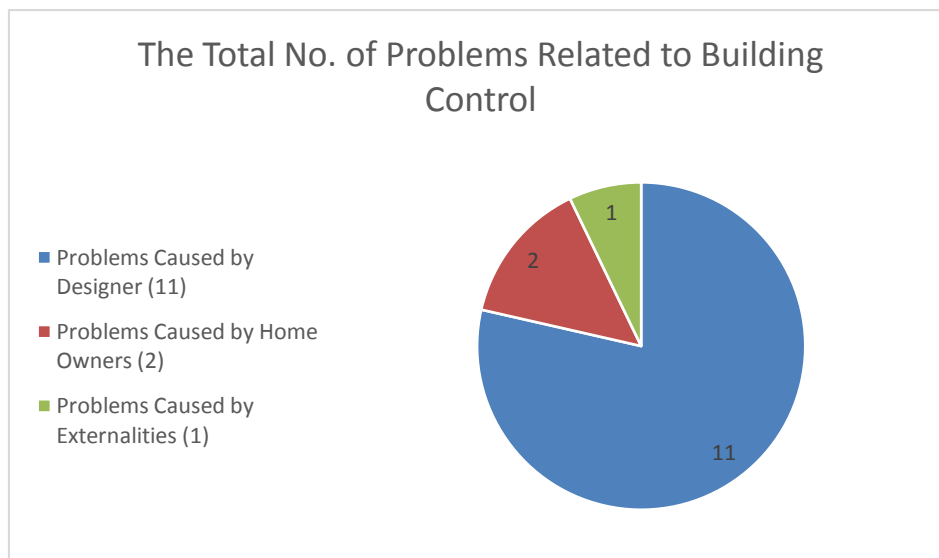


Figure 17: Number of Building Control Problems

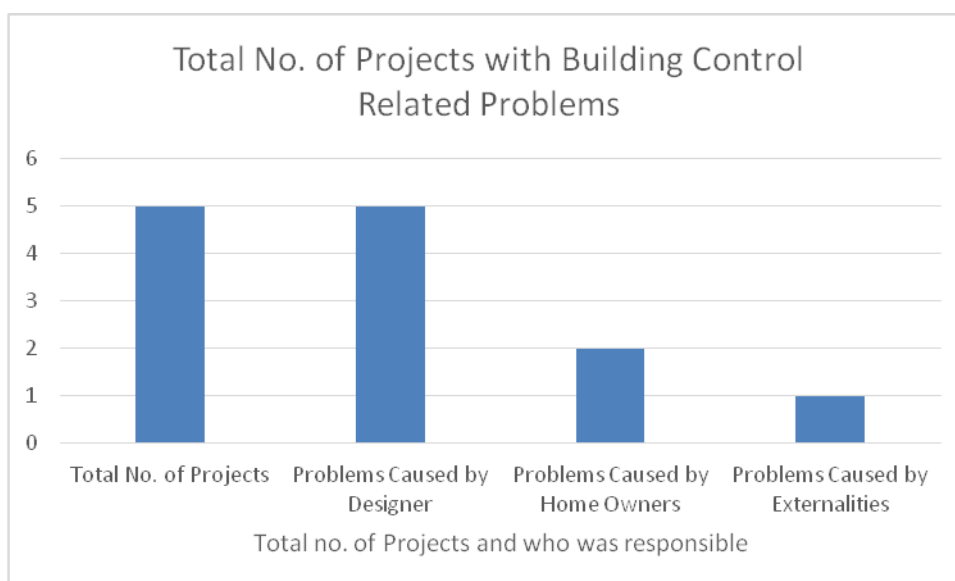


Figure 18: Number of Projects with Building Control Problems

District	Cost of a Single Site Inspection	Amount Lost on a Project by Building Control	No. of Inspections Carried out
1 (City)	£67.00	£737.00	16
2 (Rural)	£67.00	n/a	5
3 (Town)	£77.00	£77.00	6
4 (Borough)	£83.00	n/a	4
5 (County Wide)	£56.00	£168.00	8
6 (Conglomeration)	£91.00	*n/a	8

** Note in District 6, the fees paid were incorrect and above the rightful amount. So the project was cost neutral.*

Table 6: Inspection Costs

The magnitude of extra resource allocation

Applicants for full plans applications are charged one-third of the total fee for plan checking and the remaining two-thirds is charged when work commences and site visits begin. The costs of inspections are calculated on 66.6% of fees divided by the five site-visits programmed for domestic extensions. By multiplying the single cost of one site inspection by the

number of additional inspections, it is possible to calculate the extra resource use figure for a project. However, this is an estimation and not an accurate picture for two reasons. It does not include the additional office time in undertaking supplementary plan checking and structural calculations, which occurred in two of the districts. Due to poor record keeping, it was not possible to determine the length of time any site-visit required. The tables above set out the amounts of extra resource allocation beyond that originally assigned by Building Control Bodies and accomplish the target set in objective 2. (1.4).

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7.0 EVALUATION OF THE EMPIRICAL EVIDENCE

7.1 The Problem

The research has established that there is a widespread problem amongst Local Authority Building Control bodies in the southwest region of England in the use of extra economic resources regarding domestic extensions. Discussion papers and reports within the Building Control community provide anecdotal evidence that the problem is geographically widespread (e.g. BRAC, 2010 p. 30; BRAC, 2014). Recognising, that except for London the eleven Building Control regions in England are similar in composition, size, and structure (BRAC, 2008) reinforces the indication that this dilemma, subject to further research, is inclined to be a national problem as well.

The intended focus of this chapter is to appraise the factors that emerged from the data that were gathered, to determine their significance and importance and denote their implication on Building Control resource use. These factors have been grouped together from the subsections of the three themes already set out. They have been supplemented by the emergent sectoral material combining to configure each component into sections that could possibly influence or contribute to the cause of resource overruns.

7.2 Character of extra resource use

The fundamental strategy of this inquiry was to search for all phenomena that cause additional economic resource use, working within the parameters of the preliminary propositions and those identified within the data. On-site problems were discovered to be a major reason for unprogrammed site inspections and revealed as one of the principal barriers to a reduction of economic resource costings resulting in unintended cross subsidisation. On-site problems manifested the use of additional resources in different time frames and the documentation highlighted that any events from the following

contributed up to a twenty percent rise in the cost of completing Building Control functions in:

1. An additional site inspection to check conformity,
2. Time spent on extra structural calculation checks,
3. Research into differing material/product usage,
4. Correspondence and telephone calls regarding outstanding regulatory issues or resources usage.
5. Investigation and paperwork to commence legal action to achieve compliance.

The project files and archival retrieval illuminated the overall and widespread weakness in time management record keeping in all districts. There was a failure to itemise specifically task scheduling and time spent on individual functions in the office and on site. Specific events were recorded, but not in detail, so there could be significant differences in time periods assigned to similarly described events. Therefore, it was not possible to calculate the exact costs of additional resource use, only provide estimates based on average assignment periods. Nonetheless, the archive records revealed that between 48%- 57% of the domestic extension projects in the six districts for the researched year 2010 did have resource use overruns which highlights the inherent gravity of this problem.

7.3 Fee setting function legislation

All projects considered in this study were carried out under the previous Building Control fee setting regime, pursuant to which each Authority had to publish a set fee scales for domestic extensions (Building Act 1984, (as amended), para.9 sch.1; Building (Local Authority Charges) Regulations 1998, SI. 1998/3129). These restrictions never applied to other categories of construction projects where regulators are permitted to set and negotiate fees. The system of pre-determined fee scales based on the square meterage and size of an extension fails to allow any distinction between

factors that may influence outcomes. These extraneous agents had the potential capability of causing greater resource use than that covered by the prescribed fee. In contrast, Approved Inspectors have always determined their own fee structure on an individual project basis as they deem appropriate to their business. Since the commencement of the research this restriction has changed and Local Authorities, if they so wish, can dispense with pre-set fee categories (Building (Local Authority Charges) Regulations 2010, SI. 2010/404).

Local Authority Building Control units are required to cover the true costs of running the Building Control function, and have no statutory authority to fund other Local Authority service or use a surplus as an indirect taxation (Building (Local Authority Charges) Regulations 2010, SI. 2010/404). Manifestly it is an onerous responsibility to achieve such fiscal neutrality when, for example, in 6.19 the project in District 3 received one additional site inspection over programme entailing an extra £77 cost and yet the department found itself outside permitted budgetary limits. If for some reason the number of programmed site visits had been reduced then a salient point expressed by one practitioner was, a customer who has only a limited number of inspections has the right to be reimbursed for any fee charged above the cost of the service provided (Building (Local Authority Charges) Regulations 2010, SI. 2010/404). The research demonstrates that legislative compliant fiscal responsibility has added to the pressure on management to ensure that projects remain within programmed boundaries. The restriction imposed on Local Authority Building Control by Government monetary guidance and legislation of full recovery costs for the service provided does not directly influence the reasons or causes for resource overruns. However, managers were always conscious that losses caused by overruns were not permitted to be compensated from elsewhere in departmental accounts. Similarly, they were mindful there should be no excessive profit either from a project.

No evidence was found that central Government fee setting regulations were the cause of economic resource losses. The causes of overruns were not due to Building Control bodies failing to work within the parameters of restrictive Government fiscal legislation. No other research in this area has been located to permit any comparability studies.

7.4 Competition

The analysis in the private-public section in 6.18 During the recent recession, Building Control management looked closely at costings because competition increased from the private sector in a depreciating construction market. Building Control Officers, in some of the interviews, accused Approved Inspectors of being more accommodating in their interpretation of the building codes and liberal in their attitudes to achieve compliance, presenting that as one of the reasons why Approved Inspectors were making inroads in their client base. The claims by this minority about the perverseness of Approved Inspectors were not substantiated by any empirical research or found in the literature; the researcher has heard similar allegations repeated in the industry for over two decades. Most Approved Inspectors are ex-Local Authority surveyors and members of the same professional bodies as their public sector counterparts. Some Building Control Officers argued a decline in Local Authority work was a career opportunity for them to transfer to private industry, reasoning that the regulatory function had to be undertaken by somebody it being immaterial if it was carried out in the private or public domain. The literature reinforces the acceptance by Public sector Building Control of the existence of private competition (e.g. Hawkesworth and Imrie, 2009; Morgan and England, 1988). A key Government principle is that it does not expect Local Authorities to win work from Approved Inspectors by setting their charges artificially low and then routinely increase them later on (Building (Local Authority Charges) Regulations 2010 SI.2010/404, Principle 4).

No evidence was found that competition from the private sector or any actions to counter it were factors in the causes of additional economic resource use by public sector Building Control.

7.5 Enforcement Operations

Private Building Control enforcement action must legally revert back to the Local Authority in whose area the infringement of the Building Regulations occurred. Under the Building Act 1984 the public sector Authority is the statutory enforcement agency in the district where the infringement took place. The research revealed evidence that some Authorities expect their own Building Control units to assume payment for enforcement work from their own fee income rather than draw from the corporate budget. This led to a situation where in some circumstances fee payers of profitable activities, which were predominantly commercial construction or volume building, cross-subsidised legal action to achieve statutory compliance rather than the finance emanating from the corporate budget. Approved Inspectors are unencumbered by such legal formalities and possibly could command some competitive advantage if prospective enforcement arrangements have to be factored into the budgets of Local Authority Building Control bodies. Approved Inspectors, if they perceive a project to have potential problems can choose to price high in compensation for the extra work liable to be entailed. If they fail to win the commission due to high fee offers, then public Building Control will undertake the work as the supplier of the last resort. Local Authority enforcement policies are an internally negotiated matter between the Building Control, Legal, and treasury departments of the Council responsible and no literature has been uncovered that has researched this type of internal operational procedure.

Internal financial and inter-departmental arrangements were found to have no bearing on the cause of economic resources overruns or fee income. Management anticipated that if and when enforcement action took place they could induce their colleagues in their legal

departments to abide by the fiscal rules laid down by Government (Building (Local Authority Charges) Regulations 2010, s.7).

7.6 Overhead Charges

Some surveyors mentioned creative accounting by other Authorities; when fee earnings exceeded outgoings, there was a possibility of diverting financial surpluses to other cost centres and recording a budgetary result within central Government guidelines (Building (Local Authority Charges) Regulations 2010, SI. 2010/404). Accounting procedures vary between Authorities, but no evidence was found that creative financial structuring took place within the researched bodies. However, this does not mean it had not happened in the past or in non-researched Authorities. Fiscal rules can encourage creative accounting rather than fiscal adjustment (Milesi-Ferretti, 2004) and the researcher had no access to councils' accounts departments. These types of conventions could have developed over time, but any Authorities who operate in this manner could be subject to regulatory investigation by the Department of Communities and Local Government. A related subject commented on by some public sector surveyors was that recharges for office accommodation, personnel, information technology, and other services were sometimes paid to Local Authority finance departments at higher rates than available in the marketplace. The implication of such claims was that some Building Control bodies were put at a commercial disadvantage with their Approved Inspector competitors because they subsidised other Local Authority departments' costs. The researcher could not discover if this was true without comprehensive and comparative research into the local economy of each area to ascertain the commercial prices of those services and facilities.

Overhead charges in themselves cannot be the cause of extra resource use because Building Control bodies that are charged additional overhead by definition must be running a surplus budget. Also, economic resource overrun on projects have not been impacted

by the use of creative accounting practices or excessive overhead charges because these elements have not been a feature found in any of the records of the Authorities researched.

7.7 Politics

Verifiable political interference in day to day operations by Councillors was never mentioned as a difficulty during the interviews. However, elected members of all councils were perceived to be acutely aware of possible political repercussions when any increases in Local Authority controlled charges occurred. This cautious political attitude influenced Building Control management; participants alleged that a substantial case had to be presented by managers for any changes to the fee scales, which were also expected to be maintained within Central Government cost parameters. The problem was more acute in smaller bodies where there were greater interpersonal contacts between members and officers. However, there was no suggestion of members being corrupt or there being conflicts of interest, a concern raised by Doig (2013, p.670) within the framework of organisational and legislative changes. In reality, officials viewed councillors in the manner similar to Pedersen (2014, p.886) as possessing a commitment to the public interest. Nevertheless, Macaulay et al. (2014, pp.86-91) warn of the potential danger of weakened territorial integrity due to changes within local government. The dilemma all parties had to address was if fee scales for domestic extensions were set unreasonably low then departments would make a loss on minor works and have to cross-subsidise them from other categories of work. If fee scales were set high, then there was a possibility of losing contracts to competitors, exceeding the five percent rule, or inadvertently cross-subsidising.

The evidence from the research established political interference was a separate issue to additional resource use, and this factor had no influence on its resolution.

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7.8 Economies of Scale

Responses from Building Control Officers highlighted the discernible benefits of economies of scale. Authorities that have come together operationally and combined their local district Building Control functions in partnerships or amalgamated them county-wide saw noticeable improvements in cost savings and efficiency. Centralised administration led to a reduction in the number of local offices and a cut in personnel both in office administration staff and management. Teams specifically checking plans increased the number of applications processed per officer. Site inspection rates expanded as local Building Control Officers no longer had to return to the office for plan checking duties and often worked directly from home. Designated sections dealing with dangerous structures, demolitions, licensing, and enforcement action meant non-Building Regulations fee work costs could be calculated easily and recharged to the Local Authority. The introduction of specialist sections also achieved a reduction in personnel costs by decreasing the requirement to employ experienced and fully qualified surveyors in non-building code areas. The introduction of new technology resulted in a reduction in costs and administration time, but not all Authorities seized the opportunities to amalgamate and make use of the economies of scale. Factors that prevented this happening were inertia, trepidation, and the lack of management or political will to make changes. Some respondents believed operating the service at a regional level would multiply the benefits of economies of scale and lead to even greater cost savings. Bovaird (2014, p.1067) casts doubt on the advantages of the notion which pushes Authorities into consortia and mergers, recommending more attention be given to economies of scope and learning. The present research does not support this contention. Nonetheless, Dickinson and Glasby (2010) have identified that partnership working has lost some credibility in the healthcare sector, an area which adopted these practices somewhat earlier than Building Control bodies. This notion is reinforced by Purdue (2005, p.247) who details the rise of second-generation leaders who challenge the established patterns of working. At present, these working patterns and changes are relatively new to Local Authority Building Control,

who are still making improvements to the service. Past organisational failures can be attributed to difficult circumstances as well as management characteristics whereas performance failures are associated with both misfortune and mismanagement (Andrews et al., 2007). The reduction in operational costing has provided a foundation to enhance competitiveness and increase service provision.

Economies of scale and efficiency measures have proved beneficial to both regulators and regulatees. In itself, they are not a solution to the mismatch of economic resource allocation in domestic extension projects. Unless the refinements in management techniques adopted have the potential to offer up a method of unravelling this problem, then it appears this is not an area which impacts on resource overruns.

7.9 Structure of Enforcing Authorities

Each Building Control departments exhibited a tendency for domestic extension works to require more than the routine five programmed site inspections. This propensity was encountered in all departmental archives documentation to a substantial degree. Fewer inspections than programmed occurred in only one of the domestic extensions and that project's fee/outgoings were fiscally neutral. Variation in the way Local Authorities check plans and carry out site inspections has been found elsewhere (e.g. Visscher and Meijer, 2009) but this was not the outcome experienced in the present study. The structures of the Local Authorities differed both in size and complexity, but the administrative practices of their Building Control departments did not diverge significantly. These findings reinforce the work of Jas and Skelcher (2014, p.135) who found there was far less variance in the operation of public services in regulatory regimes than expected.

The structural differences of the researched Authorities and the marginal distinction in operational approaches between their Building

Control units did not influence extra resource usage. No correlation could be found to substantiate that the structure of an enforcing Authority could account for additional resource use.

7.10 Building Control instigated inspections

From the summary of cases (6.19), it was established that districts one and six had more site visits than those programmed for even allowing for extra inspections caused by external problems. These non-Building Regulation matters accounted for six additional inspections in total. It is apparent these inspections were not occasioned by a requirement to inspect due to regulatory problems per se but rather to fulfil administrative routines due to internal procedures and practices. From the archives of all Authorities, it was apparent that these types of inspection were not unusual even though this phenomenon was experienced in only two of the case studies. These inspections fell into three broad categories.

1. Attempt to gain access to check for outstanding regulatory infringements before works proceed and/or are covered up.
2. Visiting because works are presumed to have finished and a statutory completion inspection has not been undertaken.
3. Instigated inspections, because of the lack of communication from the regulatees Building Control bodies wished to ascertain the current situation at a project.

A search of the current literature failed to generate any relevant research into this genre of inspection categories.

Building Control instigated inspections were found to have occurred in two of the case studies. In addition, there was a substantial amount of projects found in the archive records where these instigated inspections occurred and thus have a powerful influence on resource use overruns.

7.11 Type of regulation (including self-regulation)

No documentary evidence was available from the Authorities' archives regarding various types of regulation because the old prescriptive regulations were superseded by the present performance regulations in 1985 (Building Act 1984). In the responses to the interviews only Building Control Officers possessed any prior knowledge about alternative prescriptive or systems based regulations and were united in their belief that the present performance regulations were the optimum method of regulatory control. There was no enthusiasm for any reversion to the old system though there have been moves abroad to revert back to prescriptive regulations (Best Practice Annual Report, 2006).

Self-certification has been suggested as a way forward for some time by extending the competent persons scheme to Builders (Communities and Local Government 2009c) Builders were quite vociferous in their opposition, and the concept of self-certification was not well received by any participants. Contractors did not wish to take this option because of the extra responsibility involved and the amount of effort and time in gaining the specialist knowledge required. Adoption of the practice used in overseas countries of self-control by Designers which permits their drawings to be deemed approved (Visscher and Meijer, 2002) is another option of drawing more professionals into the scheme. The evidence from the research manifests forcefully that mistakes by Designers are the leading cause of extra resource use by Building Control departments. The suggestion for relaxing the present regime, therefore, appears perilous given the errors in the drawings and specifications that were brought to light in the study. Regardless of these faults and misjudgements Designers tenaciously expressed their objections to undertake any role in self-regulation. With so many potential dangers and so much opposition, it would be difficult to see how such measures could be practicably implemented. The Government is encouraging the self-certification of certain types of building work and

endeavouring to expand the scheme (Communities and Local Government, 2013). Particularly relevant in light of the Department of Communities and Local Government's decision in June 2014 to bring in new rules regarding competent persons. They must now provide insurance backed guarantees for their works controlled by the Financial Services and Markets Act, 2000 s. 19. The new provision places a further obstacle in the way of Designers and Builders in attempting to achieve complete self-certification. If total self-regulation was implemented Building Control would cease their role of regulatory accountability and thus the problem of extra resource use would be irrelevant.

No evidence was found to indicate the prospect of a change in the regulatory system to self-certification would reduce additional economic resource use. There was no enthusiasm for such a move by Designers or Builders suggesting that the take-up rates if the scheme was enlarged would be very limited. There were no grounds to believe the present performance type regulations are a cause of extra resource use.

7.12 Type of application

One subject of particular interest in professional practice concerns the proposition (one of the seven identified in the literature review) about the type of Building Regulation application procedures that are used, Full Plans submission or a Building Notice. In some Authorities, the fees charged for Building Notices were greater than those charged for Full Plans applications. This was in anticipation of extra resources that might be incurred. The reasons for this were mainly to permit time spent on site in negotiation (but not additional visits) due to lack of information and detailing. In the random selection of projects it transpired only projects undertaken via Full Plans applications emerged. However, survey results (Communities and local Government 2008b) suggest that Building Notices are not being used where a clear understanding of the requirements of the Building Regulations exist,

they are being used where ignorance of the requirements is high. There is an indication that extra resource use by Building Control bodies occurs if the Building Notice route is nominated (Communities and Local Government, 2008a). This is not just on additional site visits but due to the length of time spent on those inspections and supplementary administration tasks.

The research established that extra resource use is not eliminated by the employment of Full Plans applications. From the archival retrieval, it was apparent that overruns occur within both schemes. Therefore, it is a matter of the degree of difference between the two application types how much additional resource is used over those programmed.

7.13 Home Owners

During the interviews, Builders viewed Home Owners as the primary origin of on-site problems because of design changes or other alterations requested by their clients. This was a common problem whereby contractors tend to lay the blame on clients by identifying frequent changes of instructions (e.g. Koushki et al., 2005). Though delay caused by Home Owners is classified as a compensable delay (Kraiem and Dickmann, 1987), the research failed to find any evidence of additional payment to the contractors for any delays but did reveal reimbursement for some extra work. Whilst these alterations and changes were a cause of some difficulties with contractors they did not result in a critical influence on Building Regulatory matters. Home Owners themselves admitted to changing their minds over certain aspects of their projects but thought these changes were insignificant or marginal in the overall scheme of things. In the documentary evidence, it was only infrequently feasible to ascertain from the site notes why Home Owners instigated changes. Building Control Officers mentioned the alterations in their file notes but by cross checking the conversations with the participants it was possible to build a picture of what or who initiated alterations or changes and if additional resource use was required on the part of the regulators. Odeh and Battaineh (2002, p.67) identified that

owners' interference was an important cause of delays the problem having a social genesis rather than a material origin.

Changes instituted by Home Owners were revealed as a contributory factor for additional economic resource use by Building Control departments.

7.14 Designers

The study clearly verified the findings of the preliminary study that unprogrammed site visits and unexpected Building Control Officers time is spent on solving and rectifying problems that occur during construction. The cause and reasons for these unexpected quandaries are the lack of detailing, failure to thoroughly investigate ground and drainage conditions, and incorrect surveying specifications. It has been argued this seeming abdication of professional responsibility was due to the supposition that from experience Designers know clients will accept some cost overruns or delays (Dominic and Smith, 2014). Eizakshiri et al. (2015, pp.351-352) state there is a need to move away from viewing these types of action as deviant behaviour 'but raise questions about the role of human intentionality. They claim past scholarship has taken the accuracy of plans for granted, thereby ignoring the situated (Suchman, 1987). An opportunity will be made in the Solutions Chapter 7 to look deeper into the issue of intentionality beyond the context of the conventional techno-rational approach.

When Building Control Officers were on site most of their interactions were with the Builders and when overcoming design failings there was a tendency not to record the primary cause of the problem but just note the difficulties that had arisen and the necessary rectification procedures. The site files expressed the nature of the problem but never reproached any individual. Only on subsequent reflection and during the interviews did the extent of Designers' omissions or failings become fully apparent.

Designers were the overwhelming cause of extra resource allocation in domestic extensions. Faults or omissions occasioned by Designers were the sources of more problems than most other factors combined.

7.15 Builders

The conviction amongst many Building Control Officers from personal contact, coupled with perceived public opinion through the media and indeed many Builders themselves was that most on-site problems were caused by the bad practices of contractors. This open and shut case argument was highlighted in the responses in the interviews, perhaps reinforced by television programmes (Cowboy Builders, 2012) or through articles in the press. Academic literature reinforces the prevalence of this perception (e.g. Turner et al., 2015, Holt and Edwards, 2002, Proverbs et al., 2000). The proposition is often based on the way that the lack of training and skill levels of some operatives impacts on quality outcomes (Clarke, 2006). However, in this inquiry, any such quality concerns did not influence programmed Building Control site visits. The inquiry unequivocally established that it was a completely incorrect assumption that incompetent Builders were the cause of budgetary overruns for Building Control. There were no Building Regulations problems identified in either the case studies or the interviews that were generated by the Builders. From the archival evidence concerning other projects, it was not plausible to resolutely identify if Builders were responsible for any problems recorded. It may be alleged that the entire research has failed to find an example of Builders deficiencies due to selection procedures or other methodological failures. The research is qualitative by definition and as Yin (2009 p. 55) states any application of sampling logic to case studies would be misplaced. The use of replication logic has been useful as similar results have occurred in the six cases. The way the inspection system operates, account is made for dialogue between parties to achieve compliance through fluid interaction and a build up of trust and rapport. The regime assumes that problems will be sorted out in an ongoing manner between the interested participants as works progress.

Analysis of the data confirms that it is a misconception to universally cast the blame on Builders for non-compliance problems and thereby offer them as the primary explanation for additional site visits, time, and resource use for Building Control bodies.

7.16 Building Control Officers

Satisfaction amongst participants with the attitude and efficiency of Building Control Officers was high and reinforces the research of Barr and Hammond (2012) who found rates of contentment with the regulators of over 80%. Investigating the enforcement characteristics of different regulatory officers May and Wood (2003) failed to find any correlation between their style and compliance. However, their research did not configure the data in a manner that could demonstrate a difference in resource use by officers' approaches. The present research endorses the view of Ambrose (2013, pp.12-13) that Building Control Officers and the system are working well. Though this does not necessarily mean there is no room for further improvements and efficiency savings.

The tabulation of the data concerning problems and site visits to each project (6.19) reveals some novel and unexpected findings. Building Control bodies allow five site inspections for each domestic extension project but fail to meet this target in four out of six cases. As individual projects should break even financially, then the economic resources have to be found elsewhere to finance those that make a loss. An alternative explanation may be that site inspections are not homogenous in nature. Project file notes and the computer generated management systems indicate what duties and inspections have been carried out by Building Control Officers. However, they give no separate indication of time spent at a project or travelling to site. Indeed, some Authorities do not even specify mileage undertaken for a given visit. McAdam and O'Neill (2002, pp.442-443) noted the different inspection rates of Building Control Officers which varied in range from 600

to 2,160 per year. There are a number of reasons for these discrepancies', geographical distances between projects, officers engaging in other activities, such as plan checking, and larger projects requiring greater in depth inspections. The interpretation of the data in the current doctoral study demonstrates that Designers' mistakes were the primary cause of unprogrammed inspections, inspectors' time, and associated documentation. Failure by all Building Control Officers to accurately quantify their work regarding measured time and distance makes an evaluation of specific project costs extremely difficult to calculate accurately and thereby identify the exact cost in extra resource allocation. These shortcomings are not necessarily due to lapses or errors on the part of inspectors; rather they lie with the working procedures laid down by individual departments. A tentative judgement of costs has been made approximately estimated on the assumption of one additional inspection costs twenty per cent of the inspection fee (based on a programme of five, see 6.19). The actual increase may be greater or less than the figure postulated, but it is evident that these projects still have overruns on their respective budget allocation. It should be reiterated that one of the main objectives of the research (1.4. no.3.) 1 was to discover the factors and agents that cause resource overruns rather than specifically identify precise costing for each additional activity.

It was impracticable to locate any regulators' idiosyncratic personal methods of operation either from the documentation or the interviews. There is no evidence to suggest that Building Control Officers individual style, personality, or personal work practices have produced an influence on economic resource use. Time recording and specific information data were quite poorly set out, so it was difficult to produce exact costings on how much additional resource use was employed in each project. There are significant failings in administration procedures.

7.17 Technical complications

Unexpected difficulties arising on site due to externalities that actors involved failed to foresee was not the pre-eminent cause of extra resource use on the part of the regulator. Complications and unforeseen problems occur at some time in nearly all construction projects. A generation ago details of common construction delays were compiled by Baldwin et al. (1971). It appears that many of these complications still remain the same over time and other authors have joined in cataloguing similar lists during the intervening period (e.g. Sullivan and Harris, 1986; Fallahnejad, 2012). The industry has an international reputation for projects running over time (Ahmed et al., 2003; Sambasivan and Soon, 2007). From the three themes explored in the literature review (1. Fig1) only a relatively small amount of technical complications were encountered during the inquiry which were not in some way affected by third parties' activities (social). Some problems though were revealed that could not reasonably be anticipated by any participating actor.

It appears axiomatic that some technical complications will remain outside the anticipatory sphere because actors' precognition will always be deficient in some areas. As most authors note, there will never be a situation when all external technical complications can be entirely foreseen. It has to be accepted that these difficulties will arise on some occasions, and there are no preparatory solutions to them. Therefore, economic resource use will always to some degree be affected by this type of situation.

7.18 Supplementary propositions

Theoretical and researched explanations for actual delays in the construction processes on a project though useful in the context of pre-empting contractual obstructions along the critical path would not normally

affect the Building Control inspection regime. Delays would cause hindrance to a project's time schedule but contractors would inform Building Control only when an inspection stage had been finally reached. The only impact on Building Control would be to postpone or delay a Building Control Officer inspection visit and, therefore, would not be the agency for an additional site visit or office time.

No supplementary propositions were encountered or engaged that could meaningfully add to the body of knowledge on the subject of causation of additional economic resource use.

7.19 Participants views' and opinions

Generalising of the subjects and the establishing of relationships from the raw data of the twenty-four interviews has provided illumination in linking the material and interpreting the findings. Part of the interview time concerned participants' views on various matters and themes. These ranged over a wide area of ancillary issues as outlined in chapter 6. The researcher was consistently aware that the highlighted transcripts noted as significant to the participants' views hold a personal significance as well. This is made clear by Drew (2001, pp. 29-30) when she draws attention to the 'pre-understanding that all researchers bring to the phenomena they study'. It requires self-understanding 'to sort through the tangle of past experience revealed in the beliefs that influence the way that we conduct research.'

Fees were set correctly was the unanimous opinion of Building Control Officers, which was not surprising because the inquiry revealed that even when considering interdepartmental and political pressures they were the ones who had the final say in setting the charges. In addition, they have more freedom than previously was the case because they are now permitted to negotiate fees. As might be expected Home Owners would like the service to be free but the consensus of opinion amongst all groups was they were reasonably priced. Designers had knowledge of the work

encompassed and professional input of the regulators and also regarded fees as reasonable. The majority of Builders had no involvement with the fee payments, so this issue was of little relevance to them. The empirical evidence established that fees were a non-contentious subject with regulatees which was a reassuring position for the regulators. Fees were set by Building Control management to accord with their aggregated estimated costs for a project, but they remained operationally mindful of not to cross-subsidise.

Local Authority Building Control was generally regarded as a professional service. This contrasted with the mediocre views expressed about Local Authority Planning Departments, but there was no evidence Building Control lost work due to these negative opinions. There was a general respect for the expertise and efficiency of Building Control Officers and their swiftness in response times. Relationships between the regulators and the regulatees were good, especially amongst the Builders. There were few suggestions as to how the service could be improved and most participants were content with the way the service was run and provided. Ideas suggested such as a Builder's register, or standardized application forms were met with little enthusiasm, and there were no specific indications how these measures would assist in reducing resource overruns. The evidence suggests that the status quo appeared to be the favoured option.

The volume of domestic extension work undertaken by the private sector was limited, and preference for public provision of the service was considerable. This was verified by Designers and Builders who saw little requirement for service betterment. There was no proof that competition from Approved Inspectors influences extra resource use or that a loss or a gain in workloads would influence its volume per project. Further efficiencies could be carried out through economies of scale and further amalgamations.

The data substantiates that further efficiency actions would help reduce costs and contribute to keeping fees at competitive rates but

would not bring about the reduction of any unprogrammed resource use in individual projects. Neither do Participants views offer any solutions to resource use overruns. Their opinions are that fees are reasonable that competition is good but not influential, and the status quo is the favoured option.

7.20 Summary

Rich findings and discoveries were drawn from the research involving the interpretation of the data in its cultural as well as its social context. There is confidence that the results were reliable because the triangulation confirmed the exactness of interpretation. The use of interviews, site surveys, and documentation has been a practicable means of undertaking methodological triangulation and was paramount in establishing validity. The semi-structured interviews permitted each participant in the domestic extension construction process to present their own views and opinions candidly. The on-site surveys of each extension permitted the researcher to ascertain the degree and complexity of any problems and provided an overall picture of the completed undertakings. The project files provided a record of activity as events happened and did not rely on time specific memory. The opportunity was also taken of the benefit of additional access to Building Control departmental archives. These proved advantageous because the files revealed that nearly half of the total of domestic extension projects undertaken in 2010 in every Local Authority experienced more than the programmed number of site-visits. This permitted triangulation with the other data collected and demonstrated the extent but not the exact cost of resource use overruns, thus verifying the findings of the case studies in this matter. These analytical advantages have helped in achieving, as Thurmond (2001, p. 254) states “increasing confidence in the research data, creating innovative ways of understanding a phenomenon, revealing unique findings, challenging or integrating theories, and providing a clearer understanding of the problem.” The researcher had epistemological concerns about relying on the dominant positive and quantitative methods used in construction

research in the past and wished to move away somewhat from the cause and effect approach. The idea that action and cognition are embedded in causal structures has been explored by Bandura (2001) and by Merad et al. (2011) in that institutions, structures, and systems function in a certain manner. The division of the inquiry into the themes of **governance**, **social**, and **technical** complications helped to locate the areas not just of the causality of extra resource use but how the actions of participants were shaped and how this might relate to the collective outcome. The purpose of the research is to assist actors in Building Control to enhance their efficiency, and the researcher was sensitive to the fact their outputs depend on the product of other individuals.

The three themes did not divide symmetrically; technical complications were the smallest grouping consisting of those complications that were truly unforeseen rather than socially induced and where specific governance influences could not be located. The governance theme concerning the procedures and protocols of Building Control highlighted these had an influence on resource overruns in up to half all archive cases as well as a substantial amount of the case studies. Differences between additional resource use in Building Notice applications compared with Full Plans applications was alluded to from the literature and anecdotally from the interviews but could not be verified due to the lack of comparative data. The social theme produced the greatest amount of useful information clearly identifying the major influence that the actions of Designers and Home Owners have and which are instrumental in the agency of additional resource allocation.

With the foundations of the inquiry set, evaluated, and analysed the groundwork has been completed in providing a framework to commence furnishing measures to alleviate the problem of resource overruns. The empirical data can now be explored for possible remedies and proposals.

8.0 SUGGESTIONS and SOLUTIONS

Evaluating possible solutions to the problem of extra resource use is one of the objectives of this thesis (1.4 no. 5.). In this chapter, a range of solutions are explored. These solutions are of two types. Those considered in the first part of the chapter (8.1 to 8.5) derive from the imaginative ideas expressed by the participants during the research phase, whereas the second part of the chapter focuses on functional solutions which the empirical work revealed. In the first type of solutions, ideas have not been the subject of practical investigation; they are the outcome of general discussions with the participants during the interview phase. Neither are these non-empirically researched ideas the result of any constructive inquiry by the respondents; rather they are concepts and notions that they considered might lead to improvements in regulatory control. The reason for their inclusion is to demonstrate that other actors can offer alternative remedies that are based on their own experiences and observations even though practical research is lacking. The main thrust of the dialogues concerned Building Control Officers and Designers; Builders were less interested in the theoretical and philosophical aspects of such debate. Home Owners, as might be expected, were divorced from most of the practicalities of domestic extension construction and certainly anything touching on subjects that were rather elusive to them. These first type solutions, suggestions have been found to be neither politically practical nor organisationally expedient, but they do demonstrate a broad range of lateral thinking by participants regarding theoretical improvements to regulatory control. The recommendations presented in subsections 8.8-8.12 are pragmatic, feasible, and workable remedies and are introduced in subsection 8.6.

8.1 Non-functional solutions

Abolish Building Control

Option 1

Abolish Building Control and dispense with regulatory control then the problem cannot occur. The common goal of anarchists is the abolition of coercive structures or as Kropotkin (1899) states a society without government. This would be more than a return to the eighteenth century when society had few laws concerning construction and persons built how they wished, with recourse to civil action between parties as a remedy for disputes. Total abandonment of third party regulatory power would mean the loss of building codes with societal benefits such as energy conservation, disabled access, and safety glazing. This would result in a state of anarchy summarised by Foucault (2008) quoting Kant 'Law and freedom without force.' If this came about, England would be the sole developed nation without some form of Building Control which could be unacceptable socially and politically, and there is scarce evidence that there is a public desire to adopt such a contentious solution. However, Osterfeld (1989) debates whether it is necessary to have government to insure the provision of public goods. If such goods are not public, then government is not necessary for their provision. If they are thought of as collective goods, do they require government for their enactment?

Option 2.

Abolition of public sector Building Control and delegate control to Approved Inspectors. There is a belief amongst Building Control Officers that this is the present Government's ultimate aim. Market forces would overcome the unforeseen work associated with resource allocation by cross-subsidising loss-making projects from the surpluses generated from profitable ones. The concept of privatisation is not new being suggested by Drucker (1968, pp. 233-234) when he said governments should spend more time governing and less time providing. Moves towards privatisation were intensified under the coalition government, and Landes and Pratchett (2012, pp.32-33) maintain this was due to an ideological commitment by the Conservatives which the

Liberal Democrats failed to restrain. This trend has increased under the present administration; however, there is political resistance to such moves. Bach (2012) found there has been downward pressure on public service employees' employment terms and conditions through competition from alternative providers which could impact on labour relations. Layne (2014, p.24) states this controversy reflects diametrically opposed ideological perspectives claiming that 'these arguments tend to focus on the economic dimensions of privatisation while largely ignoring the broader constellation of political and social aspects that are inherent in responsible policy decision making. From her analysis, two significant questions emerge, who would undertake the work if an Approved Inspector refused to take on a new project and who would be responsible for enforcement procedures. Possible solutions are the state could make provision for the compulsory employment of a selected Approved Inspector appointed by an arbitration panel and delegate the enforcement responsibility to private Building Control. However, the problems that cause extra resource use would still remain and the logical outcomes of total privatisation could have political, social, and industrial relations impacts.

8.2 Move to self-certification or in-house design service

Abolish all Building Control bodies and assign the obligation for regulatory conformity to the regulatees. This could be brought about either in individual groupings such as Home Owners, Designers, and Builders or a combination of those actors. The use of an independent inspectorate has been the cornerstone of building regulatory control in England for well over two centuries (Ley, 2000). Adoption of a comprehensive self-regulatory system would require a change in the philosophy and methods by which governance is executed. Though David Cameron is quoted as saying he presided over the first government in modern history to leave office with fewer regulations than when it entered, and suggests the Government will cut 90% of overzealous regulations and has a thirst for deregulation (Wainwright 2014). Incrementally some autonomy has already been

accomplished by transferring partial accountability to regulatees through the introduction of the competent persons scheme (Communities and Local Government, 2005). The analysis in Chapter 6 established that expansion of the competent persons scheme to permit Builders to self-regulate was rejected by Home Owners, Building Control Officers, and Designers and regarded with actual hostility by the Builders themselves. In New Zealand Murphy (2014, pp.297-8) highlighted the risks of failure of a similar scheme which introduced Licensed Building Practitioners and a transfer of responsibility to the private sector calling for more effective educational and legislative support. However, for large volume house Builders and contractors on major commercial projects these proposals might be welcomed.

Domestic extension Designers' were reluctant to assume an obligation for guaranteeing conformity and there would be insurance liability implications associated with undertaking these functions which would also apply to Builders or Home Owners. Protection by some form of guarantee from insurance company collapse would have to be introduced. A failure of HH Insurance in Australia in 2001 severely disrupted the provision of mandatory Builders' warranties for over a year (French et al., 2015). Besides the risks of potential insurance failures, Odeyinka (2000, p.519) discovered that settlement for costs or damages catered for only 61.1% of replacement costs. Change in the law would bring more extensive duties to contractors and Designers and deliver a situation more in line with the French system which is more vertically integrated than in common law countries (Frilet and Karila, 2012). Some form of guarantee or assurance would have to be given to potential purchasers of any property by the vendors when selling a property. Recent work by Hopkin et al. (2014, p.1153) regarding defects in new homes found Builders especially are not learning from past experience or making improvements to reduce the prevalence of defects. The research demonstrates it would be improbable that any one group of actors would be willing to assume responsibility for conformity with the Building codes. The general public would have to be assured that in cases of non-conformity a

facility to achieve compliance would remain thus transferring the cost of such action on to a new regulatory body or remaining with the Local Authority. The proposal does not address the main issue of reducing or eliminating additional resource use.

Offer an in-house design service specialising in Building Regulations. This would dispense of third party Designers and self certification proposals. However, this suggestion poses a number of difficulties regarding the impartiality of the inspectorate which could be compromised and a gamekeeper turned poacher dilemma could develop. Building Control Officers are unlikely to want to assume this role due to this potential conflict of interest. There might also be opposition from Councillors who would see this as an encroachment into the private sector market together with possible indemnity insurance issues. Legislation at Central Government level to allow this facility to be undertaken would have to be enacted which would require extensive lobbying. Undoubtedly there would be strong resistance from Designers and their professional bodies because of the substantial threat to their lively hoods such a scheme would entail.

8.3 Remove fee charge

The removal of fee charges would constitute a regression to the situation prior to 1985 (Building Control Act 1966) when the service was provided free at the point of contact and funded from the general rates. The major obstacle to the provision of a free service is it would result in the elimination of Approved Inspectors who have to charge clients for their services and would be met with fierce opposition from the private sector. It would be a reversal of the predominant political rationale that has been influential over the past three decades, whereby the cost of public services has been transferred to the user rather than charged to the taxpayer. There is a mutual confidence by both major political parties that costs can be cut without cutting services as outlined by Fitzgerald (1988, p.18) who advocated privatisation as an alternative to increasing taxes or reducing

services. The proposal would reduce minor administration costs in publishing, pricing and fee collection whilst freeing Local Authority Building Control bodies to operate outside the framework of uncertain financial externalities. Its overwhelming disadvantage would be council tax payers rather than end users of the service would have to pay for the major remaining costs and a consequent rise in general council tax. The problem of extra resource use would disappear, and the additional monies would be found from the Local Authorities' general budgets.

8.4 Remove the cross subsidy rules

The central government could make adjustments to the present provisions (Building (Local Authority Charges) Regulations 2010, SI. 2010/404) through delegated legislation by the use of statutory instruments (Statutory Instruments Act 1946). They could authorise repeal of the present rules which require Local Authorities to operate the Building Control service in a fashion that each project is fiscally neutral. This would free departmental management from operating within such narrow budgetary constraints. Extensions that had cost overruns their shortfalls could be made good from surpluses accrued from other projects. In their research Zerbinati and Souitaris (2005, p.46) contrast the different types of entrepreneurial agents in the public sector and how they negotiate the restrictions imposed by legislation, suffice to say they think that public sector entrepreneurship should not be judged from an economic- profit perspective. Whilst Ling (2002, pp.629-630) highlights the multi- bureaucratic rather than mega-bureaucratic nature of local government and how best to manage the competing claims between central and local Government. The role of management to facilitate local good practice within official central state guidance is often contradictory. The aspiration of central Government to demonstrate legislative equitability in economic dealings between Local Government and their clients highlights the distinction between the operation of private and public sector Building Control. Nonetheless, the question remains is this existing legislation necessary.

The removal of the cross subsidy legislation in its self would not aid the prevention of unforeseen overruns on economic resources merely shift the economic burden to other fee payers and ease the problem of resource allocation for Building Control Management. However, one of the fundamental principles of the Building Act 1984 was to ensure that user of the service was the one who paid for it. This philosophy is the cornerstone of Government ideology and therefore extremely unlikely to be changed. The removal of this legislation in itself would not prevent the occurrence of resource overruns it would only ease bureaucratic financial operations.

8.5 Transfer of the scale fee categories

Change in legislation has already occurred since the commencement of the research programme because Building Control bodies are now permitted to individually determine charges, if they so wish, (Communities and Local Government, 2010). Previously there was a presumption under the Building (Local Authority Charges) Regulations 1998 SI. 1998/3129 they had to prefix and publish flat rate charges. One criticism of this legislative change is that Local Authorities wishing to adopt these new measures would experience extraneous use of Building Control time in negotiating or calculating fees for quite small-scale construction activities. However, there was no evidence that this had occurred in Authorities who have made the change. A further stricture is that applicants would no longer enjoy the certainty of a set standard fee and have to enter into negotiation with the relevant Building Control department before the commencement of work. As this already occurs with clients employing an Approved Inspector or negotiating with Authorities who have made the change, it appears that this argument has little foundation. The Authorities that have made the permitted changes their systems are still functioning efficiently. However, these measures themselves do not overcome the causes of extra resource overruns. Problems and difficulties that have not presented themselves at the stage of initial application may still arise during later phases of project construction,

and the transfer of the fee scale categories to individual project pricing mechanism does not address this issue.

8.6 Functional Solutions

The interviews and interaction with the actors involved with the domestic extension projects provided the rationale and suggestions listed in 8.1-8.5 above as possible remedies to the problem of additional economic resource use. These notions and ideas were that of interviewees with many years of experience in their own distinct fields, but they were not based on any empirical investigation or research. However, interviewees have their own construction of reality is the view of Berger and Luckmann (1967), they create over time concepts and mental representations of each other's actions which eventually become habituated in reciprocal roles played by the actors in relation to each other. Reality embodies the idea of having an independent objective existence where the social construct view is this is a subjective experience.

The analysis of the research data in chapter 7 revealed the origin, source, and cause of extra costings to the regulators and its impact on the requirement for additional resource use. It was critically assessed in accordance with the fourth objective of the research (1.4) permitting the empirical evidence to be evaluated for possible remedies. The study exposed the agents that were the genesis of extra resource use requirements necessitating additional site inspections and associated administration time. The solutions furnished to alleviate the problem are specified below in order of significance in subsections in 8.8-8.12. In solution 8.7, one remedy has already been enacted due to change in legislation since the inauguration of the research programme.

8.7 Fee recharges legislation

The Building (Local Authorities Charges) Regulations 2010, SI. 2010/404 permits recharges for additional works that have arisen since the commencement of a project or reimbursement for work charged for but not undertaken. The empirical evidence reveals that Building Control departments' have not made use of this facility to recharge though in fairness it might take two years or more for the first projects approved under this legislation to be completed. This reluctance to initiate action has a number of explanations that have been outlined previously (6.18). The legislation also permits refunds to clients so Home Owners, who are the legal applicants, have the right to challenge Local Authority Building Control bodies if they have not undertaken their statutory duties fully and claim reimbursement. In contrast, Home Owners are liable to pay additional fees for extra work incurred by Local Authority Building Control. However, some overruns may be caused by mistakes on site or within the contract documents so Designers and Builders themselves could be liable to civil action by their clients if their activities have been found to be the source of additional work. The introduction of this measure is a substantial contribution to ensuring Building Control bodies have an opportunity to operate individual project budgets in equilibrium and one that could help prevent unintentional cross subsidisation. The legislation does not directly address the specific causes of extra resource use but could be of considerable use in alleviating some of the financial implications associated with budgetary overruns. Importantly it has the potential to be of use as a deterrent to other actors involved in domestic extension projects by helping to prevent them in engaging in measures that could cause the regulator supplementary economic resource use.

8.8 Building Controls' additional site inspections costings

Extraneous visits and the amount of additional time spent on rectifying unexpected problems arising during construction are difficult to calculate precisely. The number of supplementary visits from the analysis (Table 3.

5.2) averaged three for each case in the study programme. However, this figure is distorted because of the large number of visits in the first case study. The mean is a more precise indicator and using this method of measurement results in a figure of six inspections per project, one above the programmed site visit regime. A similar result was obtained from the archive records which revealed more than half of all extensions for the year 2010 had more site visits than those programmed. Unfortunately, time restraints did not permit the examination of files individually, but the overall trend demonstrated that there were often two or three extra site visits per project. Several of these visits were cold call or chase up visits due to Building Control procedural operations. If one additional site inspection could be dispensed with, then a substantial amount of unproductive resource use could be eliminated. It is a challenging task to calculate authoritatively actual cost savings, but a reasonable estimate can be made by extrapolating the average estimated cost of a site visit from the expense of the average Building Control inspection fee. From the six cases in the study, the lowest inspection fee was £68. per visit whilst the highest was £91, the mean being £72. per inspection. It should be noted that an inspection fee not only includes time spent on site but includes travel time and expenses together with any associated documentation and office work. Building Control procedures require alteration to reduce these types of site-visits in domestic extensions where there is a budgetary overrun, and thereby increase the degree of certainty of preventing cross subsidisation. Building Control Officers should be discouraged from cold calling on projects because they wish only to observe how works are progressing. Managers should ensure their staff understand project accounts should be held within these parameters, thus assisting departments from being tempted to use surplus fees from other construction projects and subsidising different work.

8.9 Unexpected externalities

The analysis established that from the problems caused by 'concealed elements/ unexpected externalities' in the six case studies only one affected the inspectorate directly and required additional resource commitment. There were five externality problems that had implications concerning the building codes. Four of these were remedied during routine programmed visits, which highlight the regulators' ongoing rectification procedures. In the order of magnitude when considering the other agents, the affect of these 'externalities' on Building Control resources is not as dynamic as other factors. However, on some occasions no matter how specific drawings or specifications are, only actually on site will problems be revealed. An example is earth construction. Not until the materials gathered up from around the project area are placed and built will actors be certain if the result is in conformity with the Building codes. A case for this sustainable type of construction is becoming more widespread due to economic issues, non-renewable resource consumption, waste generation, energy consumption, carbon dioxide emissions, and indoor air quality (Pacheco-Torgal and Jalali, 2012, p. 512). Though the regulator may call for pre-construction testing of materials the test result may not apply to the as built final outcome.

The literature reveals a multitude of research in numerous countries of construction problems and many researchers agree that cost overruns and activity delays are common issues in the construction industry (Gonzalez et al., 2014). Solutions are offered to a wide range of causal influences such as inappropriate contract documents (e.g. Odeh and Battaineh, 2002), dispute resolution (e.g. Momani, 2000), non-compliance and scheduling failures (e.g. Majid and McCaffer, 1998) and design errors (e.g. Han et al., 2013). Some research is quite specific, for example concentrating on the poor relationships between project parties and how that may influence outcomes (Mong, 2007), a phenomenon not encountered between Building Control Officers and Builders in the present research. However the unexpected externalities that came to light were but a minor element in the totality of overall construction delays but are more symptomatic of domestic extension

projects, in particular, De Meyer et al. (2002, pp.60-62) term these unexpected externalities as unknown unknowns. Creating uncertainty profiles are offered as a way forward by the authors, in practical terms, the likelihood of certain possible events occurring can be postulated or estimated depending on specific location and history. Location for example of old oil tanks, uncharted drains, and disused mine workings cannot always be exactly positioned, so their discovery and impact on resource use through additional work for the inspectorate is often just accepted.

Solutions to the issue of unexpected externalities will have to vary locationally as some problems are geographically specific. In redeveloping brownfield sites, Syms (1999) identifies location as the most important of a number of factors in whether to construct in areas that may be plagued by unforeseen problems. In three of Authorities investigated mining for silver or tin had been carried for long periods in the past, and accurate records are rare and in some cases nonexistent. Thermal imaging techniques can be used to locate abandoned mine shafts by temperature differentials, but the cost may prove prohibitive to clients and Building Control bodies. However, this is a surer method than frost circle identification whereby warmer mine air from shafts escapes into the atmosphere (Donnelly and McCann, 2000). Other areas might have similar experiences with coal, ironstone, and fireclay especially when extracted by underground methods close to outcrops (Taylor, 1968). A detailed survey of the available mining, industrial, and geological literature is required particularly since some workings can date back to the medieval period. Authorities in rural locations may have disconnected septic tank difficulties to surmount; the feasibility of abandonment has been discussed by Lu et al. (2007) but in practice relinquishment of waste water treatments that occurred some time previously would not have been regulated. This is an obvious example where local knowledge about historic construction techniques and practices are beneficial aids to locate potential externalities. Other types of tanks also can cause problems such as oil and petrol storage. Though there are tax advantages to clean up these facilities (Weld and Price, 1998) small

domestic extension projects are unlikely to have owners with sufficient resources to take advantage of dealing with this type of difficulty. Construction professionals should be aware of high water tables in locations that they operate in regularly (Das, 2015) so it is reasonable to suppose that this particular feature would be accounted for prior to construction. Though most of the unexpected externalities occur sub-surface other problems can arise within the fabric of the existing structure and consideration of these types of difficulties requires knowledge and understanding of the property that is being altered or affected by the domestic extension construction. To have any prospect of locating this category of unexpected difficulties before they materialise demands a level of professional expertise that may be lacking. Again this is a matter of Building Control bodies highlighting the problem and educating the professionals involved to be constantly aware and up to date with the current professional literature.

However, research of the archival documentation revealed Building Control bodies kept numerous historical and geological records which were a useful source of information concerning these types of quandaries. From the interviews too it was apparent practitioners possessed a wealth of tacit local knowledge and expertise which was already utilised in the foreseeing of these forms of dilemmas. Building Control Officers could enhance their extensive knowledge base by regularly checking the geological and historical archives but the period spent undertaking these tasks has to be balanced with the potential benefits and would not necessarily lead to a productive use of resources. Building Control bodies could alleviate this quandary by assisting staff to enhance further their researching capabilities regarding historical and geological archival material. Even the rereading of standard textbooks concerning foundation design problems should remind Building Control Officers of risks such as landfill problems, earth slope, methane gas and necessary subsurface investigations (Fang, 2013).

The key solution to unexpected externalities is to be ever vigilant for the possibilities of unforeseen incidents occurring on site. Building Control

bodies must highlight this problem with Designers and Builders and offer remedies and advice through purposely constructed programmes. Seminars and lectures are already run regularly for professionals in the industry by Building Control departments, and these are well attended especially by Designers. They are ideal venues in which to communicate and draw attention to problems. The advantage of locally based seminars is that problems are often locationally specific and all parties involved in domestic extension can bring neighbourhood knowledge and experience to these meetings. Thus the interaction between professionals can help delimit the likelihood of these incidents occurring. However, because these happenings are relatively uncommon the custom of 'not my concern' often prevails until it impacts on one or more of the actors involved. The managerial problem of changing staff attitudes and perceptions but in clients as well is addressed in 8.10 and 8.11 below. Conversation within Local Authority regarding these issues focuses on enhancing the intrinsic motivation of staff similar to other professions' practice (e.g. Berenson and Rice, 2015) which is often based on proposals for pay for performance schemes. Local Government research suggests that monetary rewards have traditionally been the means to motivate staff, but soft-perks are often just as important, for example, different work environment factors can influence outcomes. Morris (2013, pp.1-3) stresses the importance of the training required for managers and non-supervisory staff in interpersonal relationships, so quality workplace relationships develop. To a certain extent these remedies are already being employed to varying degrees within the researched districts, therefore, Building Control bodies are moving in the right direction on this issue.

As an alternative to the measures mentioned above or in conjunction with them, Building Control bodies could use the recharging legislation concerning extra works. This might appear unreasonable to some clients for they may have had to make quite substantial unanticipated outgoings on these very same contingencies brought forth by unexpected externalities. Whereas additional work initiated by a Home Owner, for example, can be directly assigned, these types of issues cannot always be personally

attributable. Local Authority Building Control bodies are aware of possible public relations disadvantages arising if recharges are contested by Home Owners. The accrued overheads and legal expenses could make this tentative solution economically unviable. However, the option of recharging in fitting circumstances offers redress to this form of resource use problem if cooperation, knowledge sharing, and commitment fail to provide a remedy. From the analysis of the data, Building Control Officers already foresee most of these potential unheralded events and adjust their site inspection programme accordingly. Cooperation between the regulators and contractors is the key to addressing this predicament. Ultimately the professional experience of all parties involved determines if these externalities result in an extra resource use allocation. Though, Building Control Officers are already familiar with these problems professionally and generally foresee them there is still room for refinement.

8.10 Home Owners

Home Owners' modifications or alterations proved to be a minor reason for extra resource use in achieving conformity with the building codes. Home Owners instigated changes while works were in progress and were instrumental in generating modifications or deviations from the approved drawings. Love and Edwards (2004, p.270) have demonstrated that the most significant variable in the determinants of extra costs is client induced changes. This was not found to be the case because the present study concerned minor works and Building Control rather than major projects and impacts on contractors. Home Owners perception of the consequences of their monetary actions and outlooks has shown to be misguided. Home Owners underestimate acquisition costs, but they overestimate the value of material possessions. An inaccuracy of Home Owners' estimates of their property values averaged a 6% overvaluation and an average absolute error of 14% but was found to be unrelated to their personal or social characteristics (Goodman and Ittner, 1992). Home Ownership has increased since 1945 and has lead to key changes in society; Home Owners

prefer low taxation and low public expenditure where the reverse is true for persons renting (Doling and Ford, 2007). This reflects the findings of Wilson and Banfield (1964) when they examined voting intentions of renters and ethnic groups who were more inclined to be more welfare of the community orientated whereas richer groups such as Home Owners had a more private outlook (self and family). The literature demonstrates that Home Owners are capital and asset conscious so a constructive remedy would be to ensure awareness of the potential additional expense involved in construction modifications they commission.

Home Owners as applicants are responsible in law to conform to the relevant Building Regulations and accountable for their own actions in instructing Builders to make amendments or departures to the original design proposals. Therefore, they should be the actors who bear the cost of any additional work placed on the inspectorate. Most Home Owners would be unaware of the provision concerning reimbursement (Building (Local Authority Charges) Regulations 2010, SI. 2010/404) and it should be imperative to ensure applicants have an appreciation of this recent legislation when an application is approved by Building Control. This information should be imparted by amending the wording of the Building Regulations application forms and the subsequent approval notices. Through this action, Home Owners would be fully advised that amendments or alterations to the construction work they instigate, which incur extra Building Control resource use, would have to be compensated for by accruing an additional charge. However, though this might seem an obvious solution, Building Control management should be acutely aware how any advice is, placed, worded or personally provided. Chentsova-Dutton and Vaughn (2011, p.687) argue that there are cultural differences in advice giving and advice receipt. In districts that have a multi-cultural dimension, advice may not be viewed as helpful but as intrusive. The dilemma may even be more complicated as their research did not involve groups from Africa, Asia or the Caribbean. The digestion of the information regarding the consequences of applicants' modifications potentially accruing additional

recharges may not be received or acted upon uniformly by Home Owners. Because of actors' distinct individual traits, they may interpret advice differently depending on their assessment of the value of the additional works to be undertaken. Earle and Cvetkovich (1995) concurred regarding the perceived quality of the advice and the status of the advisory agent. Though in contrast Twyman et al. (2006) established the take-up of information advice did not correlate with the estimate of actors trust in that advice.

The growing expectation of taking personal responsibility for one's actions is embedded in the rise of Home Ownership (Ford and Quilgars, 2010). However, their research shows that since the Second World War there are more low-income borrowers who have climbed onto the property ladder, but they are the most vulnerable to the risks associated with Home Ownership. It is important that account should be taken of Home Owners circumstances before any action for recharging of costs is made by the regulator. Ford and Quilgars (2010) have highlighted the failings of the insurance safety net provisions, both public and private, for low-income mortgage borrowers which shows they are the least likely to be able to respond to unforeseen financial circumstances. This dichotomy between income groups is echoed in the work of Baum and Hassan (1999) that identified non-mover alterations and mover alterations. Non-mover Home Owners better satisfy their needs by staying put either for social or financial reasons. If personal funds are limited then knowledge of potential recharges occurring if they authorise revisions to a proposed extension will make them more inclined to reconsider their decision. If they wish to proceed then Building Control bodies can invoice the appropriate charge for their costs. Either way, resource use over-runs are mitigated. Generally, Home Ownership is regarded as having a positive social benefit on society and even with low incomes there was a significant increase in self-esteem compared with renters (Rohe and Stegman, 1994). This strengthens the argument that even actors that are financially constrained have a stake in their property which they are reluctant to lose. Therefore, Building Control bodies have

more than a reasonable probability of a positive resulting outcome from any recharge action they may take. In addition, DiPasquale and Glaeser (1999, pp.361-377) found that Home Owners are better citizens than actors with other forms of tenure, so it is logical to assume they are more disposed to be cooperative when charged additional fees rather than challenge the Building Control bodies who invoice them. It should also be noted that some Home Owners may not be perturbed at the additional recharge because they perceive it as fair for the extra work undertaken and because any charge would only conceivably be a fraction of the overall contract price.

Builders too have an interest because amended and/or additional works instigated by their clients result in extra contractor costs which might require negotiation by the parties involved. They have the opportunity to reinforce this issue by reminding Home Owners that regulatory charges may also be incurred in addition to their own supplementary fees. Home Owners' actions could be revised by this additional counselling which confirms Yaniv and Milyavsky (2007) work which established substantial revision gains from multiple pieces of advice. However, their work was experimental, but Levitt and List (2007, p.153) hold that laboratory focused experimental models used in physical sciences can help understand human economic behaviour. Soetanto et al. (2001, p.528) maintain that clients are more satisfied with contractors' actions than that of Designers; the research has confirmed these findings. Nonetheless, the results of their investigative study indicate that Builders still need to improve all aspects of their performance. In this particular field, Building Control has the opportunity through continuous on-site contact with the Builders of discussing the significance of Home Owners alterations and the consequences of additional resource allocation. As Winter and May (2001) point out actors that were well informed and advised about regulatory matters had a greater feeling of obligation to conform to them. The Building (Local Authority Chares) Regulation 2010, SI. 2010/404 legislation also has application advantages as a deterrent factor for use in subsections 8.9 and 8.12. Improvements in initial advice and promotion of information by Building Control should potentially discourage Home Owners

in taking action that might cause extra resource use by the inspectorate. Home should be made fully aware of the consequences of their supplementary, altered, or amended instructions to their builders which result in additional site visits will be charged to them. With this knowledge, Home Owners will be able to make a rational choice knowing the full financial repercussions of their actions.

8.11 Procedures and protocols of Building Control

Four of the additional inspections undertaken in the case study projects were instigated under the researched Building Control bodies' internal protocols as outlined in 7.10 above. The documentary evidence in the archive files established that many domestic extensions were contractually completed, and the Builders had left site but no formal request for a completion inspection had taken place. There were a number of reasons why this may have occurred. Most commonly there was a misunderstanding between client and contractor as to who would request the final inspection, presumably Builders did not wish to return to site and wait for an inspection when they were working elsewhere on a new contract. Building Control officers perceived that Home Owners believed they would be revalued for council tax purposes once a completion certificate was issued, so they delayed the regulatory completion inspection. Sometimes minor finishes were required to extensions which Home Owners' wished to finalise themselves. The documentary evidence revealed that all Building Control units had standing orders to visit sites where a completion inspection request had not been received after a set period of time from the date of the previous site visit. It is the statutory duty for the applicant to inform the regulator when a completion inspection is due (Building Act 1984 s16) and not the duty of the inspectorate to keep visiting. It is quite clear that procedural change is needed and more information than furnished already is required underlining the obligation of Home Owners to notify the regulator when a statutory inspection is due. Usually, the Builder requests the inspections but Home Owner should be informed personally when the

documents regarding approval are first sent out. Also, the Building Control Officer should verbally enlighten Home Owners if they meet or alternatively request the Builder to pass on the information.

Archival evidence proved that some regulators were eager to remove projects from their books and tidy their filing systems. On other occasions, they aimed to verify the current situation at extensions which had not requested a site visit for some while; the standing orders set out by the various Building Control bodies advocate site visits should be instigated to projects that are progressing slowly. These procedures might on some occasions be appropriate if a Building Control Officer is visiting a current project nearby but otherwise, it can mean a substantial amount of time travelling and cold calling. These protocols should be dispensed with or at least curtailed by prohibiting the majority of follow-up inspections. Such action would help diminish the organisational impact on additional economic resource use. However, this solution comes at a cost due to the statutory obligation the inspectorate has on behalf of the community to ensure works are in conformity with the building codes. To overcome this predicament, it would be expedient for Local Authorities' to emphasise in correspondence to applicants' their personal responsibility to inform Building Control when statutory inspections were required, and this aspect of the dilemma could be at least partly subjugated. This could be addressed at the same time as they inform Home Owners of recharge legislation as mentioned above.

Where a completion inspection was due but the applicant omitted to request one, rather than visiting on an ad hoc basis a more cost efficient method would be to send a standard letter or e-mail requesting formal access. If an Authority failed to receive a reply they could still close the project file but would be unable to issue a completion certificate. They should then inform the Home Owners they are closing the documentation and use the power vested in them to place a charge on the land register stating that the extension has not been officially completed, a fact that would be revealed on the subsequent sale of the property. However, Authorities may feel these

actions might lead to accusations of negating their responsibilities to ensure projects are built correctly, especially if there are cases of outstanding regulatory issues or discrepancies that are required to be addressed. The private sector overcomes these problems by threatening to transfer projects over to the Local Authority for enforcement action together with additional cost to the client of a new Building Regulations application. Local Authorities cannot require a fresh Building Regulations application, but they can threaten enforcement action. In rare cases where these types of actions do actually result in enforcement litigation, the legal costs are borne by the general budget of the Authority. Public sector regulators are the enforcers of the last resort and any of their enforcement activities should be funded from the general finance account of the Authorities and not from Building Controls' departmental budgets. If this fails to take place and the financing does emanate from the Building Control budgets then this becomes an internal departmental financial issue.

One of the objectives of the research (1.4. no.2) was to determine the extent of extra resource allocation above that originally assigned. Unfortunately, this costing cannot be gauged with absolute certainty in regard Building Control bodies' internal procedures due to record-keeping discrepancies. A noticeable feature common to all Authorities is the lack of accurate time management procedures. In some units Building Control Officers averaged out their site inspection records by allocating their time and mileage exactly the same for each project they visited. For example, if they did eight inspections in a day and travelled 80 miles then each visit was recorded as an hour and accounted for as 10 miles of travel. Similarly, they averaged out their office tasks so when plan checking, each project was registered as taking the same amount of time. When looking at cost overruns, most of the figures are averages and, therefore, are a generalisation and not a fully authentic picture. Nonetheless, statistical time information input costs have to be evaluated against the benefits of the additional information acquired as Pyatt (2005, p.33) states labour income must be balanced by the valuation of consumption. A change should be made in protocols to specific computer

generated time recording which would provide a more precise measurement of additional economic resource use. These changes would not eliminate the problem but would provide error-free data on which future remedies could be based and permit management to obtain a more accurate costing for individual projects.

In the 1980s, there were calls to have a market-driven Building Control service and the challenge for leaders was to make a dysfunctional public system more effective. Six principles were characterised by Osborne (1993) which demonstrated entrepreneurial departments were catalytic, competitive, result oriented, mission driven, customer driven, and enterprising. This management style has continued since that time, but criticism can be levelled at Building Control generally both in management and staff terms of maintaining an insider perspective of any problems. A criticism aimed at professionals within the industry by Flyvbjerg et al. (2009) for their internalised views. Because Building Control Officers are concerned with the specifics of the case in hand they are not always able or concerned to contemplate the wider picture. Often situations and events repeat themselves and patterns and systems that emerge either go unnoticed or are ignored due to actors' focus on precise time frames and the particular. Because there is little occasion to reflect it becomes harder to commence the processes that help contribute to learning from past mistakes. Niskanen (1968) defined two critical bureaucratic characteristics, maximisation of the *total* budget of their bureau and exchange of outputs for a specific budget. However, his argument is limited because Building Control is not acting as a monopoly, part of its income comes from the marketplace and not all functions are entirely bureaucratic. This tends to make management act schizophrenically trying on one hand to be competitive yet on the other to be a service provider for other public bodies. The protocols of follow-up inspections mirror this dual role in endeavouring to fulfil a statutory function yet at the same time operate as a commercial enterprise. Proposals to change protocols can be met with either free market enthusiasm or bureaucratic inertia, but Adler and Borys (1996, p.62) offer a way forward

from this impasse defining two types of bureaucracy enabling and coercive. If managers are already predisposed to market solutions, then they should fit more easily into an enabling strategy to change office protocols and employees functions. A coercive outlook demotivates staff and stifles creativity whereas management wishing to overcome the problems of resource overruns has to provide guidance to Building Control Officers and clarify responsibilities. Through this enabling lens, new ideas and remedial action to overcome additional resource use come about. The dichotomy between enabling and coercive approaches is also reflected in the disparity between macro Marxian and micro Durkheim views of society (Brown, 1978). So epistemologically speaking when Brown (1978) discusses Bureaucratic organisations as praxis he refers to an argument of advancing critical sociology for action to change society. Building Control bodies have already moved into a changed and changing environment and this is a continuing and ongoing process. Alterations in working practices and change in documentation protocols can be achieved which should assist in the eradication of additional resource overruns via different standing orders and procedures combined with alternative organisational systems.

8.12 Designers

The overwhelming reason for regulatee induced additional site inspections and related regulatory activity by Building Control Officers has been shown to be the failings caused by Designers in their specifications and drawings. If measures are taken to address these issues, then a substantial amount of time and resource use on the part of the inspectorate could be averted. The first thing that should be brought to the attention of Designers is the provision for recharges for additional work incurred by Building Control over and above that covered by the original fees. As stated in 8.7 Home Owners are liable for any additional fees sought by the regulator (Building (Local Authority Charges 2010) Regulations SI. 2010/404) and would have recourse to civil action if the extra costs were due to Designers' negligence. Designers of small domestic extensions do not usually have the same

liability concerns regarding economic loss resulting from faulty plans and specifications to the degree larger practices involved in more complex construction projects have. Though Archer (1985) states English courts have narrowed the broad protection once afforded to Architects in various ways. Small scale Designers are not usually Chartered Architects though they may well be Chartered Surveyors, Architectural Technicians, or members of other professional bodies. Action for liabilities to third parties by Designers in this range of practice is rare and there is no documentary evidence of it occurring in the research. Contemplation of potential litigation predicaments would institute a more cautionary approach on their part. Information regarding recharges for additional work to be included on the application forms and automatically brought to the attention of Designers in the normal course of a submission for Building Regulations approval has already been mentioned as a remedy.

Designers' mistakes are not usually brought to the notice of the actors who produced the drawing and specifications, Love et al. (1999) criticise the poor information flow in construction and liken projects to a chain which is only as strong as its weakest links. The research evidence indicates that Building Control Officers and Builders cooperate in overcoming issues as they arose and as works proceeded but the initial agents who occasioned these events remained outside the loop. A large proportion of construction mistakes are due to design errors according to Koskela et al. (2002, p.6) and assert that theory-driven tools can achieve improvements in the process of construction design. These tools appear no different to other suggestions that independent researchers have conceived. Effective measures of amelioration such as theory-based methods and empirical observations seem to be different labels nominated for similar components. Kumaraswamy and Chan (1998, p.27) highlighted the importance of elements such as intensive site investigations and design information to address on-site delays which need to be transferred into practice. According to Soetanto et al. (2001, pp.542-547) Designers themselves have prioritised drawings as the area of maximum need of improvement.

Peansupap and Ly (2015) found design errors were the most important group of factors impacting negatively on construction costs and call for more research into this phenomenon. Burati et al. (1992) found design deviations averaged 78% of total deviations and were a major and significant contribution to additional project costs. These figures are conservative as they only account for direct costs to the main contractors and not to other agencies. The authors too suggest remedies; actors should look through historical records and identify mistakes and thereby focus on their reduction in future projects. Error-producing conditions have been identified as emanating from factors influencing the design practice through to individuals in the design task. Organisational and project defence barriers have been proposed by Love et al. (2011, pp.180-181) via intra and inter-organisational learning but these recommendations would have to be executed by individual firms and organisations.

The requirement for improvement in design quality should be encouraged argue Oyedele and Tham (2007, p.2090) and the results of their research were devised to stimulate architects to perform better. Design errors were identified by Wong and Vimonsatit (2012, p.3390) as an element that affected construction schedules but this factor has been established by a number of researchers over many years (e.g. Ogunlana et al. 1996; Kraiem, et al., 1987; Assaf, et al., 1995; and Koehn et al., 1978). What are required are specific solutions to this problem. Beshears and Gino (2015) point to five basic steps in overcoming preventable mistakes and maintain that it is difficult to rewire the human brain to undo patterns that lead to errors. Designers can learn from their own experiences according to Dursun and Ozsoy (2007, p.82) postulating the need for post-occupancy evaluations to achieve projects that fulfil the needs of all involved participants. The demotivation of Designers has been highlighted as a problem by Oyedele (2013, p.342) but the research appertained to larger firms. This does not necessarily mean this phenomenon is absent within smaller or solo practices, but the issue focuses on individual personality differences which could be less disposed to develop in small-scale practices. The optimum

way to address this problem would be to educate Designers by highlighting examples of problems caused by their colleagues that have occurred on other past projects. Detailing individual cases where things have gone awry due to Design errors, incorrect surveys and so forth would provide Designers with an opportunity of learning from previous mistakes made by their third party colleagues. Rational persuasion would make Designers better off (as judged by the regulators) but primarily benefit the inspectorate. Hausman and Welch (2010, p. 123) emphasise that efforts to shape third party choices should be made, so they protect actors from abuse, and their autonomy is respected. It would be a simple task to produce documentation highlighting these common defects with suggestions how they might be addressed and overcome. It would be more problematic due to financial restraints to provide individual expertise assistance.

The evidence of this research has been verified by the literature, but the proposed solutions the various authors offer have not been implemented in practice. The question to be addressed is, do Designers actually read academic papers or journals or are there more appropriate ways of communicating or actioning change. A piecemeal remedy is not the answer rather a concerted application of remedial solutions is required encompassing the entire design side of the industry. In Holland, a register of Designers' mistakes has provided useful information. Its effectiveness has not yet been proved as it was not common knowledge within the Dutch Building industry (Terwel et al., 2012, p.25). However, progress has been made since 2012 in advancing and enhancing the scheme. Three studies from different data sources undertaken by Terwel et al. (2014) demonstrated that information concerning private reporting systems highlighted that the largest cause of structural incidents was design mistakes. Dijkshoorn et al. (2013) researching reliable building processes to avoid design failings found significant differences in the data between successful and less successful projects. Adoption of a similar confidential registration procedure in the UK would achieve improvements not just in domestic extension design but in other sectors of the construction industry as well. Advocating such a scheme

would require action at national level amongst the professional institutions affected rather than solitary initiatives by firms and solo practitioners. Fortunately in the UK work has been pursued in this direction, though not specifically on failure data bases, but in a briefing on forensic engineering by Ratay (2012, p.111) who stated that forensic analysis and education are key components in improving British civil engineering. However, a methodology to categorise historical data for use in identifying quality deviations was presented over twenty years ago (Burati et al. 1992). Action has not taken place even though academic investigation has highlighted the areas of shortcomings. As it is apparent this situation has remained prevalent but not rectified for a long time all possible empirical evidence should now be engaged to bring about a change in practice procedures and individual working approaches. This would entail the adoption of the remedies advocated in Holland and by Ratay. Action should be taken at a national level via the professional construction and design institutions in combination with the relevant Government departments to initiate this shift in concept.

Hughes (1993, pp.34-5) claims that construction needs people who can deal with conflict and Architects are best placed to do that. He maintains architecture is essentially a subjective process that cannot be reduced to a set of rules or procedures, but fear of liability proceedings are causing Designers to lose control of contracts. Hughes' research clearly indicates that Designers of the projects investigated had no individual control of the contract and no personal input after plans had been approved. However, he does demonstrate that it is the lack of practical knowledge that Architects are most severely and frequently castigated for, which marries in precisely with the present findings. He produces various reasons for the demise of Architects and the rise of other actors in the field; in the case of domestic extensions, the research highlighted the primary reason for engaging this specific type of Designer (Architectural technicians, draughtsmen) was they are comparatively inexpensive. The strains and supports between the contained community of Architects and wider society investigated by Goode (1957) when observing the professions, has been eroded and tested over

the past decades, and the sense of communal identity, shared values, and organisational power over the membership have all been gradually corroded by externalities. The performance of all actors, even in their changing roles, in the field of construction, can always be refined, and Oyedele and Tham (2007, p.2097) list a number of areas where improvement of Designers' delivery could occur particularly in project communication and buildability. Presentation and execution of supplementary guidance by Local Authority Building Control would assist Designers to achieve these goals, but even more particularly if combined with a confidential register of Designers' errors as mentioned above.

So far solutions and remedies proffered have been primarily governance based, but the importance of making changes that will reduce extra resource use requires a remedy in the social context too. Designers' assumptions regarding their operational procedures concerning domestic extensions require challenging. Eizakshiri et al. (2014, pp. 350-351) point out that many researchers have focused on deviations from the plan rather than the plan itself. They highlight political-economic explanations in contrast to technological interpretations. Flyvbjerg (2002) draws attention to what he calls strategic misrepresentation, whereby if a project can look more beneficial on paper then it increases its chance of going ahead. Therefore, the accuracy and adequacy of plans should be questioned not only through political-economic explanations but also from a psychological perspective. Mistakes are made by Designers due the limitations of imperfect human nature referred to as cognitive bias (Kahneman and Tversky, 1979). Flyvbjerg et al. (2009) have identified territories where they believe deceptions might arise such as economic self-interest, accountability and other incentives for Designers to produce favourable specifications and drawings. Designers may be open to self-delusional traits in areas such as insider thinking leading to optimistic view bias and tendencies to underestimate the tasks they perform. There is a distinction between intentional and unintentional actions (Malle et al., 2001) and this applies equally to the regulators as well as the regulatees. An appetite for Designers to censure or blame Builders

for most construction problems was found in the research. This suggests a tendency towards a collective bias in perception on the part of the profession leading to the directing of blame to other quarters. Kumaraswamy and Chan (1998, p 27) contend 'the origin of such biases may be traced to group conditioning, as well as the present adversarial nature of construction systems.'

Economic considerations, advice, information, and education should assist in modifying Designers' attitudes and help change their outlook whilst providing awareness of the problems they generate. However, it would be simplistic to maintain that the solutions based on the present research will eliminate the problem entirely. In fact, implementation of any measures by Building Control bodies should first and foremost take account that influencing Designers to enhance their performance is a judgement on the part of the regulator. Therefore, Authorities should make sure not to exploit non-rational factors that might influence Designers' behaviour. Hausman and Welch (2010, pp.124-125) are clear that actors should be informed of efforts to shape their behaviour by rational persuasion. Riemer (1976) holds that error is socially organised and that this would be a key factor in alleviating mistakes, he claims that the existing social structure is indifferent to the needs of the consumer because Design workers have more freedom than other employees over their working conditions. One of the objectives of this study (1.4.no.5) is to unearth and address these types of issues and discover ways to implement measures that alleviate economic resource use overruns. Oyedele (2010) examined possible attributes that influence motivation in actors regarding organisational behaviour. Working from the resulting outcomes of that research it should be possible to predict actors' motivation levels within Building Control organisations and Design practices. Further research into intentionality that is actors who performed acts intentionally (Eizakshiri et al. 2015) is required. The five elements that constitute intentionality are provided by Malle and Knobe (1997, p. 101) consisting of 'a desire for an outcome: beliefs about an action that leads to that outcome: an intention to perform the action: skills to perform the action:

and an awareness of fulfilling the intention while performing the action.’ It is summed up succinctly by Drew (2001, pp.18-19) one’s directed awareness of an object or event. Viewing the documentation of the present research from a different perspective, an opportunity should arise in future to investigate if human beings are not necessarily ‘passive receptors of rules manifested through documents’ as Ferraris (2015, p.423) contends, which suggests a division between documentality and intentionality. Changes within professional practice have to commence with a commitment from the top of the organisational structures. Leadership is a process of social interaction and can be defined in social psychological terms as well as emotional processes according to Dasborough and Ashkanasy (2002, pp.615-616). Employees’ within the regulatory sector and members of professional bodies’ attribution about their Leaders’ intentions influence how they evaluate and interpret leaders’ attempts to transform situations.

Within both the regulatory and regulatee sectors of management a genuine and resolute commitment to transform procedures and practices is required that will cascade down and be accepted by both Building Control Officer and Designers. The importance of ensuring rectification advice is acknowledged and understood by Designers would fall primarily to individual Building Control Officers and their respective departments. These same Officers would have to be familiar with and fully understand the type and manner of design failings that act detrimentally on departmental resource allocation. The research revealed the working interaction between Designers and Building Control Officers is usually quite amicable but business like so there is a strong suggestion these issues could be addressed in an ongoing manner and perhaps in a personal way. Building Control bodies frequently run training and continuing professional development courses for a variety of persons involved in the construction processes. These seminars are predominantly attended by Designers, contractors are usually less well represented, but these occasions provide a significant opportunity to intercommunicate. Those involved in Design mechanisms should be enlightened and encouraged to produce at the very least a marginal change

in their culture; this would make a beginning in preventing design faults and omissions occurring. However, the maximum modification in Designers' behaviour and intentionality can only be brought about by organisational change in the professional institutions that control their profession. The use of the deterrent factor in recharging for extra work incurred by the regulator through Designers' errors, under the auspices of the Building (Local Authority Charges) Regulations 2010, SI. 2010/04, has already been mentioned above.

8.13 Summary

The most substantial disclosure from the outcome of the research was how significant Designers as a group were as the primary cause of extra resource use by the regulators. Though non-conforming conditions do occur on site due to contractors errors the violation defence barriers in place by the regulator are sufficiently robust, in most cases, to prevent additional costs accruing to the inspectorate. The admirable interaction, humour, and cooperation between Building Control and Builders avoid the proliferation of contractor induced violations from either commencing or alternatively are foiled quite rapidly on subsequent discovery. Though Builders have a tarnished reputation and unsympathetic media relations the research reveals this outlook is untrue. Building Control procedures and protocols require restructuring as there is noteworthy atrophy of resource use through slipshod practices. Adoption of the recommended rectification solutions advocated above should assist in the amelioration of additional Building Control overspend and aid the elimination of the weaknesses and failings discovered within the research project.

9.0 CONCLUSION

9.1 Preamble

Economic resource use over-runs for domestic extension projects has been a constant dilemma in personal Local Authority Building Control practice for a number of years. Despite linear programming measures and adoption of economies of scale to find financial solutions to the problem, it still persists. Undertaking an erudite research programme into its causes was regarded as a constructive way to address this issue. The research was academically rigorous, not industry championed, and embraced time and resources that would be unavailable within the normal commercial and workplace setting. The inquiry provided an opportunity to explore the matter from an entirely original perspective, from a different standpoint, and within a scholarly framework. The personal decision to proceed in this direction and ascertain if solutions were possible in areas outside the expertise of practice finance departments and the confines of Local Government have been justified.

The literature revealed that there was a noticeable scarcity of specific research concerning domestic extensions and an inappreciable amount concerning construction regulatory disciplines and specifically Building Control. There was more regarding construction in general, both nationally and internationally especially with regard to volume house building, large scale and commercial projects. In the early stages of the programme there were difficulties in trying to access and locate the relevant literature, but with greater experience and additional help, opportunities availed themselves to cultivate further inquiry in a broader and deeper fashion, a process that has continued throughout the current examination.

At the onset of the research, the paramount task was to establish if resource use overruns in domestic extensions were more than just a local practice based phenomenon. The findings from the preliminary exploration phase substantiated that this was the case and at least a county-wide issue rather

than peculiar to a single district. The interview findings with the staff of the inspectorate were corroborated by the archival intelligence. On reflection, a postal questionnaire to other Building Control bodies might have established this fact, and so it would have been possible to have covered a greater geographical area. This course of action was not taken due to concerns regarding response rates. Following subsequent meetings with Building Control personnel including in the latter course of the programme, there were favourable reactions to the inquiry which provided evidence to assume that a credible feedback rate would have resulted if this method had been employed. The case study selected for the preliminary exploration stage was untypical of the majority of domestic extension projects. It had enforcement action and arbitration proceedings, though interesting they are exceedingly rare for projects of this size. An alternative procedure would have been to choose at random a number of domestic extension projects from the in-house archives (which would not have not been subject to data protection issues) and conducted interviews only with the practice Building Control Officers responsible. This approach would have presented methodological and ethical difficulties in trying to administer impartial questioning. Interviewing the respective Home Owners, Builders, and Designers would have taken up an inordinate amount of time for just a preliminary exploration. Almost surely the researcher would have been familiar with many of the Builders and Designers concerned.

On completion of the preliminary investigation phase, various methodological options were contemplated and considered, this eventually led to the devising of an appropriate framework for comparative evaluation which has since been demonstrated to be worthwhile. A distinction between two epistemological positions did arise but different types of problems require different methods of analysis, and the value of any particular method depends on its pragmatic utility. Some of the data analysis proved burdensome due to the volume of information collected. The N-Vivo software especially generated an extensive amount of detail to a point where it was resolved to terminate the programme and permit the project to

progress. However, the subsequent application of Thematic Analysis aided the conquering of this difficulty though it failed to compensate for lost time. Structural surveys of each property were carried out but were a misapplication of the time schedule because they failed to reveal any structural or regulatory information which was not later found in the Building Control Officers' file accounts. Nonetheless, it was regarded as a precautionary necessity that these were carried out lest something of regulatory substance may have been overlooked. Individual case files proved less functional, due to the scarcity of detail in site note taking. However, the ambition of establishing the degree and breadth of additional financial resource use over that programmed was ultimately achieved. The multiple case study design followed replication and not sampling logic and provided compelling support for generalizability which occasioned the eventual decisions regarding the selection and implementation of the remedial solutions. The mechanisms that were established for the case studies achieved their purpose in identifying the cause of resource overruns.

The interviews were the most dynamic element of the research but generated a substantial amount of data. It may have been more appropriate to have omitted generalising the conversations in the latter parts of the questioning. These brought in the concepts and notions of the participants without actually contributing to the empirical evidence of causation and failed to furnish any serious practical solutions. The value of instrumental utility affords the researcher the power to explain the observations made about the interviewees and then potentially influence future outcomes and practices.

From the transcribed interviews it was discovered that Building Control Officers and Designers regarded the primary cause of resource overruns as contractors' poor performance. Professional judgement was almost unanimous in this conviction and surprisingly reinforced by the opinions provide by the Builders interviewed. Yet the research established a discrepancy between actors' perceptions and their comprehension. They all

expressed a high regard for the majority of the Builders personally known to them, for there was a substantial degree of amiability between the separate groups. These contradictory views were often founded on trivial and adverse incidents and interactions from the past but primarily on hearsay and reinforced from articles in both the local and national media. This say one thing and mean another epistemic divergence has been shown to be a frequent trait reflected amongst other professional groups (Vahamaa, 2015).

The overall archive evidence acquired from the various Building Control bodies was extremely useful in positioning the numerical extent of the problem demonstrating that over half of all domestic extension projects had resource use overruns. The raw data took some while to collate but was a relatively straight forward, though mundane exercise.

The research has provided new understanding, not through practice based fiscal remedies but rather by exploration of social and governance themes which can offer explanations into complex causes of financial problems. The influence of individual elements within the two themes was determined and then critically assessed along with the lesser factors found within the theme of technical complications. These permitted the measure of impact that each factor had on the problem to be reasoned thus enabling a broader remit into research for potential solutions to be established.

Within the theme Technical problems, Building Control project files for each of the case studies highlighted the contribution of extra resource use that unexpected externalities have. Technical problems were recorded in five of the domestic extensions investigated. However, in four of the cases these Technical problems were dealt with by the inspectorate as and when works proceeded. Only in one case was it necessary to undertake a rectification inspection. The archive records revealed the number of inspections for each domestic extension project but to establish how many cases there were peculiar to technical complications every file for the year would have to have been looked at singly. Also due to poor record keeping, it would not always

have been possible to diagnose the exact reason for every visit listed even if every file was examined. The only rational solution to this dilemma would have been to interview the 90 Building Control Officers (approximately) involved in the inspections and request them to recall the reasons for their inspections. Clearly, this would be an impractical task given the time and financial resources allowed for the research project. Therefore, it was impossible to triangulate this section of the archive retrieval with the case studies. Though it is clear from the case studies that technical problems did occur this evidence is the only proof that can be advanced. Unexpected externalities influence resource use but from the data obtained they appear not to be as critical as other problems located within the social and governance themes.

New Knowledge has been developed through this inquiry in a number of fields. The most important territory was the revelation within the social theme that Designers were unexpectedly found to be the cause of so much additional resource use. Though the literature signalled Designers' contribution in influencing construction delays and mistakes, there was no information or research regarding their impact on regulators' resources. Neither were there any investigations or research regarding this issue concerning specifically domestic extensions and Designers' errors, oversights, and omissions. The volume of problems revealed that directly burdened the inspectorate with additional resources use was noticeable in consideration that traditional practice rationale was to censure contractors for this phenomenon. The extent that Designers were the cause of such dilemmas was evident, and this fresh intelligence has the potential to significantly alter practitioners' outlook regarding this sector of the construction industry. As a side consequence, this unique insight helps to address though somewhat obliquely the misconceptions held about contractors in general. A similar but far less dramatic situation surfaced regarding Home Owners, the literature illuminated their influence on contractors but was silent in relation to the results of their actions regarding domestic extension projects and Building Control. This area has not been

researched in any other previous inquiry, regulatory practitioners appeared to be ill informed about Home Owners' revisions and alterations and thereby their consequential influence as a cause of extra resource use.

The procedures of Building Control bodies were an obvious route of exploration to discover means to reduce resource overruns. Management in all Authorities were aware there was leakage through their operational procedures but claimed they had neither the time nor resources and incidentally perhaps the inclination to review practice strategy in this domain. If they had systematically investigated their own files, they would have discovered similar results themselves, but they would be applicable only to their own individual practices. The research of domestic extension files covering a one year period in six Authorities, through the use of sampling logic, provides substance to the notion that operational strategies and policies are the source of appreciable economic wastage to the inspectorate. The investigation into the influence the structures of Authorities had on events reinforced and complimented the existing body of knowledge. For it found regulatory practices and outcomes to be remarkably similar rather than dissimilar as was one time thought (McAdam and O'Neill, 2002). The influence that the sort of applications have (Building Notice or Full Plans), the archive records revealed resource overruns were endemic to both types. Further research is required to establish if there were unequivocal differences between them regarding extra resource use and to what degree.

The three themes on which the foundation of the research rests have proved pivotal in highlighting the complexity and richness of the real world but at the same time facilitated the links between academic research and practice. The remedies that have been tendered should assist in the alleviation of the problem in public Building Control if they are effectuated by the respective executives capably as proposed. Objectives 5 and 6 (1.4) have been achieved through the furnishing of possible solutions to the problem and methods of their execution.

9.2 Factual conclusions

Designers

The single most significant contribution to the existing body of knowledge is the discovery of the immense influence that Designers have on resource use outcomes. Regulators have assumed that once applications have been approved for Building Control purposes that all is satisfactory with the drawing and specifications. When construction commences and if works go awry then remedies are negotiated between Building Control Officers and Builders. This tends to lead Building Control Officers to focus specifically on contractors who they perhaps unconsciously hold responsible for Designers errors especially if there were difficulties in implementing agreed remedies. The lack of awareness by the regulators of the significant connection between Designers' mistakes and failings and resource use overruns is noteworthy. This is especially true because of this common assumption that Builders were primarily responsible or perhaps because Building Control Officers do not seem to give this assumption much thought. The literature revealed that Designers' mistakes were one of eighteen causes of delays on major construction projects which contributed to additional resource use to contractors. No work has been discovered regarding how these delays may have affected Building Control bodies. A lack of investigation specifically into domestic extensions, and in particular, the genre of Designers who are engaged in the field of minor works is apparent. The present inquiry assists in filling this gap.

Building Control Procedures

Research into different types of regulatory control is quite extensive, and the research has been pre-empted to some degree by the change in legislation

Building (Local Authorities Charges) Regulations 2010, SI 2010/404 permitting the recharging of additional works by the Authorities' to the clients and allowing each project to be individually priced. This provides governance based economic solution but does not offer any social or technical resolutions. In this context, the protocols and procedures of Building Control which require change would in practice be operationalised in terms of a fiscal setting. The research found the monitoring of slow construction projects and follow up calls to projects which are thought to be completed, substantially contribute to resource overruns and requires robust and progressive resolution.

Home Owners

The current literature recognises that Home Owners can cause contractual problems which result in fiscal consequences. Previous research has been primarily concentrated in areas such as domestic appliances, internal décor, and other fields where Home Owners actions impact on service providers. The present inquiry is unique in identifying complications that have a specific Home Owner dynamic in relation to construction, minor works, and Building Control that has not been investigated elsewhere. That Home Owners can influence outcomes and to what extent has not been determined by previous inquiries. This thesis advances the knowledge in his topic area from a more expansive and generalised setting to a specific combination of events and agents.

Unexpected Externalities

The research revealed a social dimension in that Building Control staff's reputable expertise could be enhanced and built upon in the form of gaining further intelligence regarding unexpected externalities through an adaptation of their aptitude attributes. Designers and Builders to varying degrees exhibited complementary expertise in local and professional knowledge but also required flexibility in their disposition towards potential external difficulties. The contribution of this research demonstrates the extensive technical comprehension of all the parties working in this field. However,

there are limitations to that knowledge and practitioners' actions which the empirical evidence shows require redressing. Though most external difficulties should be foreseen if appropriate action is taken, this unfortunately, is an optimistic assumption; and is unlikely to happen because inevitably there will always be the unexpected unexpected.

Builders

The majority of the inspectorate's day to day interaction is with the contractors on site. The regulator has far less contact with Designers and Home Owners. The overwhelming perceptions of the participants in the interviews were that the construction industry, in general, had a poor reputation for its workmanship, reliability, and practices. The case studies refuted these assertions, and no examples of substandard works were found. However, the literature supports the actors' apprehensions, and so this factor cannot be ignored just because the replication logic employed in the case studies failed to find a correlation. An explanation for this phenomenon is that mistakes made by Builders are rectified as work proceeds and any contravening works are reinspected during routine programmed visits. An alternative account is that in all of the case studies every operative had worked for larger contractors in the past. They had all worked on large sights and the majority had been in the industry for a substantial period of time. A plausible supposition is that experienced operatives leave the commercial and volume building side of the industry to go self-employed. They work on small projects locally with a team of companions that can operate amicably together over long periods of time. Nonetheless, the Construction (Design and Management) Regulations 2015 which came into force towards the end of the research programme may contribute towards a beneficial influence on similar types of domestic extensions in the. Domestic clients normally transfer their responsibilities onto the project contractor or the principal one if there are more than two (CDM 2015). Construction workers must only carry out construction work if they have relevant skills, knowledge, training, and experience. Since the commencement of the research new training schemes have further

encouraged recruitment of more apprenticeships and increased grants to attend college (CITB, 2016). The negative opinions of the participants at the interview stage do not in reality reflect the actual real adeptness on site of construction workers or the new measures to improve construction standards. Suffice to say the recent new systems brought forth can only help improve on the proficient standards of workmanship already found amongst the researched Builders.

9.3 Conceptual conclusions

Four categories of solutions are advanced below to respond to the dilemma of causation of additional resource use to Building Control. They have been grouped in this manner rather than proposed as remedies for every singular causal event. This is because it would have given rise to duplication or triplication of solutions already set out in those earlier causal happenings.

The deterrent factor

Through the utilisation of the existing recharging legislation Building (Local Authority Charges) Regulations 2010, SI. 2010/404 extra work undertaken by the regulators can be charged to the Home Owner. No empirical evidence from the research indicated that this had any influence on outcomes. This was because Building Regulation applications for the case study projects were submitted and approved before the enactment of this legislation. Interview evidence demonstrates that Building Control Management and Authorities' legal and finance departments are extremely reluctant to use this facility due to fear of public relations repercussions or the additional legal costs involved in collection. Neither have any Authorities publicised this legislation in their literature, so this law is almost certainly unknown to Home Owners. However, as a remedy at local level departments should highlight the provisions of this act in the literature they send out with applicants' Building Regulations approval notice. Home Owners, as applicants, should be made fully aware then that departures

from drawings, alterations, and other problems that cause the regulator additional expense over the fees already charged could be reclaimed. If Building Control bodies decline to utilise the provisions of this legal remedy, then they will bear the consequences of their failure to act. All Authorities should be encouraged to utilise this legislation.

In reality the major problem in using the recharging legislation is that the notice of recharge has to be served on the Home Owner who has the legal responsibility for the project. Home Owners have been shown not to be the primary cause of extra resource use to Building Control. If a Home Owner is recharged but the additional works entailed are due to Designers' or Builders' errors, then the only recourse is for the applicant to take civil action against the offending party. This situation also applies to works that are in contravention where a sec. 36 Building Act 1984 is served again liability falls on the applicant. Legislative change should be enacted to include third parties through the use of Statutory Instruments laid before Parliament. Building Control bodies would then have even more incentive to use the measures provided in the legislation.

As a change in the current law would be necessary to bring this solution about, the Department for Communities and Local Government would have to be persuaded this was a practical and workable solution. Lobbying and maintaining pressure on the Government would have to be embarked at a nationwide level. To successfully achieve this aim national organisations representative of the Building Control profession would have to undertake the necessary negotiations. Best suited to this task would be the Building Regulations Advisory Committee who already advises the Secretaries of state for England and Wales on Building Regulation issues. The support of the Royal Institution of Chartered Surveyors and the Chartered Association of Building Engineers would also be essential. The views of organisations that Builders and Designers belong to, for example, the Royal Institute of British Architects, Chartered Institute of Architectural Technicians, and the Chartered Institute of Building would have to be taken into account as any

legislative changes would impact on their members. Before any of these proposals could commence expert legal opinion would have to be sought to establish the feasibility of such changes in the law and the practicalities of their implementation.

The communication factor

The employment of education and information would highlight the problem of the causes of resource overruns encountered by Building Control through the actions of regulatees. This is a problematic element because methods of informing the diverse groups that influence outcomes can be contentious. If there is an overall agreement on moving forward to impart a particular message or intelligence, then there is a requirement to discover if that information is correctly received. Further, if it is being acquired appropriately then the question has to be asked, is it being responded to and in a manner that influences the reduction of resource use overruns in a positive fashion. If this does not occur then, how can the messages and information be enhanced or elaborated and how can actors' responses be altered or improved upon.

Various approaches are possible to provide information, but it is also important to elicit intelligence from regulatees themselves and monitor reactions and constructive suggestions. A contemporary way to proceed should be the instigation of a chat room whereby users who are dedicated to the topic of domestic extensions could interconnect in real time and exchange ideas. The system should be set up by each local Building Control body via the internet and potentially expand across district boundaries.

Questionnaires and mail outs are a further way that Building Control departments can disseminate information and in this manner permit a two-way flow of intelligence to become available. If resource overruns are highlighted especially as a problem for the inspectorate and common difficulties encountered are brought to the attention of the regulatees once

they fully appreciate and understand the problems they potentially cause then they are in a position to feedback their own personal views.

Building Control departments hold regular in-house seminars, to which most Designers attend if only to keep up their Continuing Professional Development requirements. Local Builders are also invited to these gatherings but appear in far fewer numbers. These meetings present an ideal opportunity to put the message of extra resource use across while highlighting the role that regulatees play in helping to limit their occurrence. Seminars also provide an ideal chance to bring in guest speakers who could be engaged for their expertise in such fields as intentionality or social cognition.

It should also be remembered that personal interaction is often the most effective way of communication, especially if the subject matter is broached informally during normal engagement between regulators and regulatees. Building control Officers are engaging continually with Builders and Designers in the everyday course of their work. Often these contacts are well known, and relationships have been established for some period of time. These encounters provide perpetual and ideal opportunities to get the message across.

The co-operative factor

Three important elements to emerge from the research were the need to transfer research into practice (e.g. Kumaraswamy and Chan, 1998), ways of addressing designers mistakes (e.g. Terwel et al., 2014, Dijkshoorn et al., 2013, and Ratay, 2012.) and the concept of intentionality (e.g. Flyvbjerg et al., 2012, and Eizakshiri et al., 2014) The awareness of both regulators' and regulatees' social cognition relies on the ability to perceive, interpret and explain the actions of others, a factor which is fundamentally based on those notions of intention and intentionality (Malle et al., 2001pp.131-145). This concept is probably the most onerous to communicate and its successful execution in the field would require further research into this type of event

particularly with reference to the area of regulatory control. Assistance is necessary in one way or another to bring forth change in this field; alternatively it could be realised and actioned by agents who are familiar or expert in this concept.

Cooperation is required between the organisations that represent the inspectorate (e.g. Royal Institution of Chartered Surveyors, Chartered Association of Building Engineers, and Building Regulations Advisory Committee) and the various professional bodies that Designers belong to (e.g. Royal Institute of British Architects, Chartered Institute of Architectural Technologists, and Institution of Structural Engineers). After ongoing consultations are initiated the ultimate aim would be to create a confidential 'mistakes register' similar to the scheme piloted in Holland. To implement this type of programme in England would require further research on how efficient and useful the project is in the Netherlands. It would require inquiry into its efficiency and ascertain if all or any of the elements of the system would require adaptation for the British legal structure. Co-operation would have to involve all the relevant bodies and institutions at a national level because implementation would be difficult if not impossible at a local or regional level. The Dutch scheme does command some interesting conceptions and could potentially make a difference if implemented in the UK, not just for the regulators but the construction industry in general.

Building Control working practices and procedures factor,

The most critical area of failing is in time management recording. This shortcoming was observed across the whole spectrum of the research. No exact detailing is presented in the project files of accurately and unequivocally stating the precise time spent on an inspection and travelling to and from a project. This problem is simply overcome as most of the computer programmes used by the departments provide this facility. It is the working practice of Building Control Officers dividing up inspections and times to conveniently input average periods spent on site that is the issue. Until all site visits are recorded meticulously, it is impossible to correctly

calculate the true rather than the standard expense of an inspection and the authentic cost of each project.

Other procedural changes are necessary, distinctively in the area of casual site inspections. Surveyors call on the off chance to see how works are progressing as they happen to be near or passing by a domestic extension project. This maybe a functional use of resources and accurate time management would aid in confirming or refuting this notion. However, some records, especially on completed or near completion projects demonstrate surveyors are trying to gain access to property where no one is at home. In reality the law (Building Act, 1984) places the onus on the owners to inform Building Control when a statutory inspection is required. Therefore, if no requests are forthcoming then the inspectorate has no statutory duty to visit. For expediency sake it might be more practical to visit sometimes in anticipation of preventing future problems. Realistically there has to be some compromise dependent on individual situations. Overall the aim should be to endeavour to minimise cold call visits and if the department thinks there is a necessity for an inspection Home Owners should be communicated via e-mail or post to arrange an appointment and thus transfer the obligation back to the applicant. Where a completion inspection is never undertaken rather than squander resource time, the Home Owner could be informed that a completion certificate will not be issued or if there are outstanding issues these will be entered on the Land Register. Either way any subsequent sale of the property would be impeded until an inspection for completion was undertaken or any outstanding contraventions had been rectified. This information should be printed on the paperwork sent out when Building Regulations approval is first granted (ref. as part of a deterrent factor).

The differences in resource use between Building Notice and Full Plans applications has not been investigated via the case studies as no projects researched took the Building Notice route. The archive records show there is resource wastage within both systems, due to poor record keeping it was not possible to establish if there were substantial time spent on site

differences. The literature and the interviews demonstrate that actors believe Building Notices are more problematic. In fact, two of the Authorities researched charged a lesser fee for Full Plans applications in anticipation that they are less trouble. This example could be followed by other bodies. However, this action may only reflect the extra works Authorities perceive are entailed rather than the reality or alternatively is used as a method of encouraging applicants not to submit Building Notices (ref. deterrence factor). Further substantive research is required to verify the actuality of this phenomenon.

Based on the empirical evidence presented in this thesis, change in Building Control operational protocols and methods are the most straightforward to implement. Effectuation can commence at a local level and spread outwards adequate publicity for the evidence in the need for amended organisational approaches can be presented in the professional journals, at seminars, and at annual conferences. Nonetheless, informal gatherings and meetings of Building Control management are potentially the most efficient way to actuate real changes in working practices. Interaction between surveyors as well as the leadership can raise up fresh and perhaps novel ways to improve on efficiency methods as proposed and ongoing changes take place.

Building Control Management has a substantial role in implementing any proposed changes through the use of enabling strategies (Adler and Borys, 1996) especially if they are predisposed to market solutions and synergise with their staff. Nonetheless, the rest of the workforce must play its part. Building Control Officer already command a great deal of knowledge and know-how regarding local circumstances and buildings, but further specialist understanding would not go amiss. Research into geological and historical conditions as well as ongoing refreshment of practical structural and design problems would further enhance their professional expertise. This additional discernment could assist in alleviating problems that either arise on site that Builders may have overlooked or are indiscernible during the plan checking stages of Designers drawings. These auxiliary capabilities could in some

measure reduce the amount of extra resources used up due to unexpected externalities. Though as mentioned previously in unexpected externalities p.281 their elimination entirely would be rather too hopeful.

9.4 Implications

The final objective of the inquiry (1.4. no.6.) was to explore the ways that solutions could be brought to fruition. The wider consequences of the research will bear realisation in the coming years when the practical and conceptual solutions have occasion to be implemented by various Building Control bodies. On an individual and localised level the explanations and remedies already described, with cooperation, can be employed in personal practice forthwith. It will then be necessary to monitor the improvements in limiting resource use overruns and evaluate and then broadcast the results within the profession so similar measures can be enacted in Building Control bodies elsewhere. In reality, there is continuous interaction within the profession and diffusion and dissemination of discoveries and suggestions materialise constantly. Arguably, the recommendations produced by the exploration should have a plausible prospect of implementation due to its professional association with practice rather than remaining domiciled in academia. Nonetheless, for action at a national level, much work will be required to form the necessary frameworks and engage personnel to help enlist the support of other professional organisations. Achieving change at this level will be a formidable task and the later execution of the dissemination of information downwards for provincial level action. However, as the processes mentioned above take place other weaknesses in the research, than those already illuminated, may come to light and require further critique.

9.5 Research Culmination

To conclude, it is perhaps helpful to draw together all the strands of the research project into a distillation of proposed solutions which should, according to the findings of this research and if adopted by relevant actors, result in a reduction in the amount of resource over-use by Building Control in respect of small extensions.

Proposals for Implementation – Designer Shortcomings

- This research has demonstrated that Designer shortcomings are by far the most significant contributor to resource use overruns by Building Control. Recharge legislation under the Building (Local Authority Charges) Regulations 2010; SI.2010/404 was enacted after the research case study projects commenced. This empowers recharge against Home Owners. However, it is proposed that there would be benefit in extending the legislation so that Designers and Builders (as well as Home Owners) can be re-charged if their errors cause additional work.
- Action at a national level is required by the various institutions that represent the professions involved (e.g. RIBA, CIAT, RICS, CIOB) to encourage discussion of Designer errors and its implication in resource over-use.
- It is proposed that a Register of Mistakes should be introduced to permit confidential reporting of errors by any participant in the process. This will permit Building Control to conduct more effectively underpinned forensic briefings, based upon anonymised real life incidents which are more likely to have a positive impact on actor behaviour. This would be coupled with improved documentation and could also be leveraged in the context of seminars and more informal ongoing interaction between Building Control Officers and Designers,

to enhance awareness of Designers about problems and recommended solutions.

Proposals for Implementation – Building Control Procedures

- The procedures and protocol of the individual Building Control units have been shown to be the cause of a considerable volume of additional site visits. It is proposed that managerial changes are required in some Authorities to ensure that exact and accurate digital time recording of all sites inspections is undertaken. Implementation of this change will require careful introduction and ongoing maintenance to ensure this measure is permanently sustained and thus there is an accurate picture of actual resources expended on a project. Time recording has the additional advantage of providing a wider picture of all departmental activity.
- It is proposed that the accounting actions of Building Control Units should be reviewed to ensure that the re-charging legislation is used in every case to maximise returns. It is accepted that initially such a step may face resistance from stakeholders and therefore the introduction of this step change would need to be carefully handled. The first step would be to train Building Control Officers in their role to assist in guidance and information. The programmes of seminars and training events hosted by Building Control would be ideal opportunities for this type of change to be raised and discussed between regulators and regulatees.
- The research has identified that chase up and cold calls to site cause an unnecessary additional cost burden on Building Control. The proposed solution is to remove these activities from operational instructions, and replace with the much less resource intensive solution of postal or e-mail access requests.

Proposals for Implementation – Home Owners

- The research has demonstrated that the actions of Home Owners are only a minor contributor of additional resource use by the Inspectorate. Where it occurs, it is primarily where Home Owners make changes to the original designs. It is proposed that this problem can be solved by using the recharging legislation which would mean either Home Owners would refrain from changes or accept the consequences of their actions and either way, there would be no net resource impact on Building Control. In order to effectively operationalise this process, particular in view of consumer rights, Building Control bodies would need to ensure that clear information was provided to Home Owners prior to commencement of work. This process of Home Owner education could also be exploited to address one of the issues noted above in that Home Owners could be more fully informed of their obligation to request Building Control for statutory inspection. It is proposed that the likelihood of Home Owners complying with this obligation and requesting inspections could be increased by Building Control highlighting not just arguably nebulous social obligations of Home Owners not to cause costs to rise, but also particular systems of deterrence such as withholding completion certificates and/or placing charges on the land register.

Proposals for Implementation – Other Issues

- The research demonstrated that unexpected externalities have some impact on resource use, but the nature of these externalities makes them particularly difficult to address in advance. Certainly it has not been possible to identify a deterrent solution which seems suitable in these cases. It is therefore proposed that the most likely way to minimise the impact of unexpected externalities is to improve the level of information available about local issues, and its accessibility in a process of education and cooperation between regulators and regulatees. Uncertainty profiles, local knowledge and records, are key

areas in alleviating this issue. It is proposed that reliance on good relationships between Designers and Building Control Officers should be supplemented with additional training and education in this area especially permitting Building Control Officers be given adequate time to expand their expertise in this field.

- The case studies did not reveal any resource overruns due to contractors' errors. The perceptions of the interviewees and the views expressed in the literature are that Builders are the source of mistakes that contribute to this problem. This research unexpectedly demonstrated this was definitely not true to any noticeable extent and that interaction and relationships between Builders and Building Control were remarkably affable with much mutual respect. The research has aspired to show that in this particular section of the construction industry that the situation regarding Builders proficiency' is not as calamitous as is often made out. CDM (2015) should contribute to improvement in Builders' competency in addition to enhanced training schemes but are probably of more functional use to the industry in medium and large scale projects. The setting up of internet chat rooms by each Local Authority Building Control department would aid communication and relations between all types of regulatees and the regulators, so there would not only be a two-way flow of information but one of multiple interactions. In a similar manner, departments should advance their communication and advice position, and develop their customer service profile through the use of mail outs and questionnaires.

Final Word and The Future

Based on the research laid out in this thesis, the combination of solutions proposed, should if fully implemented, substantially reduce the resource use overruns discovered within the research project. However, these remedies can only be actioned over a period of time, and it would be unrealistic to visualise progress immediately at a national level, though prompt execution could be carried out for local level improvements. Realistically, a few

resource overruns are always bound to occur due to the inherent characteristics of the construction industry particularly regarding unexpected externalities. The next phase of the research project would be to commence operationalisation of the proposed solutions.

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APPENDICES

Appendix 1 consent form

CF 27.06.12. (1)

Consent Form for Research into the Causes of Excessive Financial Resource Allocation in Achieving Conformity with Building Regulations in Domestic Extensions.

I have read and understood the project information sheet (PIS v 1). ☐

I have been given the opportunity to ask questions about the project. ☐

I agree to take part in the project. Taking part in the project will include being interviewed. ☐

I understand the interview will only be recorded (audio) if I so wish. ☐

I understand that my taking part is voluntary; I can withdraw from the study at any time and I do not have to give any reasons for why I no longer want to take part ☐

I understand I shall remain anonymous and my name will not be used in this project. ☐

I understand my personal details such as phone number and address will not be revealed to people outside the project. ☐

I understand that my words may be quoted in publications, reports, web pages, and other research outputs but my name will not be used. ☐

I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of that data and if they agree to the terms I have specified in this form.

☐

I understand that other researchers may use my words in publications, reports, web pages, and other research outputs according to the terms I have specified in this form.

☐

_____	_____	_____
Name of Participant	Signature	Date

_____	_____	_____
Researcher	Signature	

Appendix 2 letter regarding pilot study

HBC 27.06.12 (2)

Dear Sir,

I am a Principal Building Control Surveyor and I am undertaking a Doctoral Research Programme with the University of Salford, School of the Built Environment.

I am particularly interested in the amount of financial resources Building Control Departments use in achieving compliance in **domestic extensions** in comparison with other types of construction work.

A pilot study was carried out in 2010 amongst a number of Authorities which suggested that **domestic extensions** are often only marginally profitable to Building Control or are even loss making in some instances. I wish to discover the reasons why there appears to be so much time and effort spent in achieving compliance on these projects and if this is a particular problem in your district.

The case study would form part of series of case studies that are to be carried in a number of Building Control Departments. The participants would most likely be the Building Control Surveyor, the Homeowner, the Designer, and the Builder. The participants involved in the extension project would be contacted and requested for an interview, this would be voluntary and confidential. On the basis of the interviews, archival retrieval, Government records, current literature, and the project file problem areas might be identified. These identified problem areas in all the case studies will be analysed to determine a correlation or pattern. Possible solutions to these problems will be established the aim of which is to improve the overall delivery and organisation of the service.

I wonder if it would be possible for you to select three or four relevant completed **domestic extension** projects and provide me with the contact details. I would then communicate directly with the Homeowners to seek interviews with them, the builders, and the designers. By this means and the law of averages, I hope I would be able to achieve one case study in your district. I would seek the written permission of the applicant to view your file on finalisation of that part of the research and only then would I need to come to your office to complete the research in your district.

I enclose a research participation information sheet, a research consent form, and a participant's invitation letter for your information together with a self-addressed envelope for your personal reply.

Yours sincerely

P.A.Irving

Appendix 3 letter to heads of departments

LETTER TO HEADS / MANAGEMENT

27.06.1(1)

Dear Sir,

I am a Principal Building Control Surveyor and I am undertaking a Doctoral Research Programme with the University of Salford, School of the Built Environment.

I am particularly interested in the amount of financial resources Building Control Departments use in achieving compliance in domestic extension in comparison with other types of construction work.

A pilot study was carried out in 2010 amongst a number of Authorities which suggested that domestic extensions are often only marginally profitable to Building Control or are even loss making in some instances. I wish to discover the reasons why there appears to be so much time and effort spent in achieving compliance on these projects and if this is a particular problem in your district.

I would like to seek permission to view some of the Building Regulation application files for domestic extensions that you hold. I wish to select one to use as a case study. The case study would form part of series of case studies that are to be carried in a number of Building Control Departments. The participants would most likely be the Building Control Surveyor, the Homeowner, the Designer, and the Builder. The participants involved in the extension project would be contacted and requested for an interview; this would be voluntary and confidential. On the basis of the interviews, archival retrieval, Government records, current literature, and the project file problem areas might be identified. These identified problem areas in all the case studies will be analysed to determine a correlation or pattern. Possible solutions to these problems will be established the aim of which is to improve the overall delivery and organisation of the service.

I enclose a research participation fact sheet for your information and a self-addressed envelope for your personal reply.

Yours sincerely,

P.A. Irving

Appendix 4 letter to participants

(L2)

10 Raleigh Close
South Molton
Devon EX36 4DS

University of Salford Manchester Research Project

Dear Madam,

Further to our telephone conversation of today's date, thank you very much for agreeing to take part in this research project. The doctoral research programme is for the University of Salford Manchester into the application of the Building Regulations in domestic extensions.

Details about the interview and study are set out in the enclosed research Participant Information Sheet (PIS v 1). I also enclose a copy of the informed consent CF(1) form which I will ask you to sign **at** the interview.

I thank you for sparing me your time to help with this project and I assure you that there would be no resulting unsolicited contact calls as the research is purely academic in nature. As explained in the enclosed sheet, any information provided would be treated anonymously.

I enclose a self-addressed envelope for you to return the signed permission to view the Building Regulations file PMBC (1) for my interview with the Building Control Officer. I would also be grateful if you could let me know the name and address of your builders so that I may speak with them.

In the meantime, should you have any queries please do not hesitate to contact me my email address is pairving@hotmail.com and my telephone no is 01769 574373.

Yours sincerely

P.A.Irving

Appendix 5 participants invitation letter

PARTICIPANTS INVITATION LETTER

27.06.12. (L1)

Address

Interviewees' name

Interviewees' address

Date

Address of property/project

University of Salford Research Project

Dear Mr/Mrs etc,

I hope you do not mind me contacting you. I am a postgraduate student at the University of Salford and I am undertaking some research into the application of the Building Regulations in domestic extensions. I believe that you have recently [had a domestic extension constructed/constructed a domestic extension/acted as consultant in respect of a domestic extension.]

I am writing to you to request that you take part in an interview about the above project. More details about the interview and study are set out in the enclosed research Participant Information Sheet (PIS v 1). I also enclose a copy of the informed consent form which I will ask you to sign at any interview you grant.

I would be very grateful if you could spare me just a little of your time to help with this project and I assure you that there would be no resulting unsolicited contacts calls as the research is purely academic in nature.

I am happy to meet you at a venue and time to suit you. As explained in the enclosed sheet, any information provided would be treated anonymously.

I do hope you are able to assist. To help you in contacting me to arrange an interview I enclose a self-addressed envelope. If you prefer my email address is pairving@hotmail.com and my telephone no is 01769 574373.

Thanking you in anticipation.

Yours sincerely

P.A.Irving

Appendix 6 permission for access to project files

PMBC(1)

To whom it may concern

I the undersigned grant Mr P A Irving, doctoral research student at the University of Salford School of the Built Environment, permission to access and view the Building Control files held by your Authority concerning the extension I have had constructed at the address below.

This is for the purpose of aiding research into the reasons for the allocation of greater financial resource use in achieving conformity in domestic extensions than in other types of construction projects.

Name

Signed

Date

Address

Appendix 7 participant information sheet

RESEARCH PARTICIPANT INFORMATION SHEET PIS v 1

You are being invited to take part in a research study. Before you decide to do so, it is important for you to understand why the research is being done and what it will involve. Please take your time to read the following information carefully and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. The information describes how you can make a contribution to the study and also ensures that you are aware of your rights as a research participant.

Thank you for reading this.

Background and aim of the project

The main aim of the project is to explore the reasons for excessive financial resource allocation used in achieving conformity with the Building Regulations in domestic extensions. The study should provide solutions to problem areas and enhance Building Control service provision. The researcher is a post graduate doctoral student in the School of the Built Environment at the University of Salford. The duration of the study is approximately nine months.

The project proposal has been reviewed by the University of Salford Research Ethics Panel.

Why you have been invited to participate

Firstly, because you have been a key actor who is involved in the construction and regulation process of one of the domestic extensions chosen for research. Secondly, because of your opinion is valued regarding the aims of this project. You will be one of a number of individuals who have been involved in various domestic extensions chosen for research that has been invited to participate. Taking part in the study will be entirely voluntary. If you decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. In the event of your withdrawal from the study, any data that you have provided to date will be removed from it, and all records of those data will be destroyed. The way in which you will be invited to participate is by giving a one-to-one interview with the researcher involved in the study. The interview will normally take no longer than 40 minutes and will be recorded. This will be transcribed into a written format by the researcher. A copy of this will be sent to you on request.

Taking Part in the Project –Benefits

Through taking part in this project, you are helping us to find answers which will be used to further enhance the Building Control service. Other beneficiaries' could be Homeowners, Builders, Designers, Local Authorities, and the community in general.

Confidentiality and Data Protection

Files and documents relating to the Building Regulations application for the domestic extensions selected for this research will form the basis of this project. If you consent to take part in this study be assured that all your details will be anonymised and all hard copy information will be stored in a secure locked cabinet or if stored electronically computer password protected with access only to researchers in the project. Any tape recordings will only be made with the participants consent and will be destroyed once the project is completed. All information collected will be kept strictly confidential. Please be assured that at no time will anyone, or most

importantly any location be identified. However, some of the anonymised data may be quoted in reports, web pages, and other research outputs or used by other researchers.

After the Project has finished – Results of the Study

This project is part of a doctoral research programme; the data collection will form part of a doctoral thesis. The data may also be used in the publication of papers in peer-reviewed journals and may be publicised in other forms in the construction industry or regulatory system.

Decisions

If you are happy to take part now you have read this information we would be grateful if you could sign the attached consent form and either return to the address below or bring with you to the interview.

Thank you for your time and I look forward to meeting you.

I welcome any suggestions or questions regarding the content of this information sheet.

Signed:P.A.Irving

Date:

Peter Irving
10 Raleigh Close
South Molton.
Devon
EX36 4DS

Telephone contact No. 01769 574373

Contact E-mail address pairving@hotmail.com

This research is being supervised by Brodie McAdam a Senior Lecturer at the University of Salford, School of the Built Environment. If you have any concerns, or would like to discuss any issues arising, please do not hesitate to contact him:

Brodie McAdam

School of the Built Environment

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Contact email address W.B.McAdam@salford.ac.uk

Appendix 8 register of builders

During the first interview, the manager of the Building Control department brought attention to a scheme that had been suggested during meetings with other managers. This idea was taken on board by the researcher and the subject broached in subsequent interviews with the remaining participants. Under the proposed scheme a register of approved Builders recommended by their clients as proficient contractors and nominated by perhaps two other clients would be compiled. If their work conformed to regulatory standards and they had a good reputation with the inspectorate they would be allowed a discount in fees by that department. It was suggested this would be advantageous to approved Builders' clients and a way for contractors to gain potential customers. The Local Authority would be sure of contractors' competence and be able to undertake fewer site visits than normally programmed. The reasoning behind this concept was it might help solve resource allocation in domestic extensions as the regulator could be sure of the proficiency of the Builder and less than average construction problems would arise so there would be little chance of additional site inspections occurring.

The subject of a Builders register gave rise to the greatest variation of opinion and was not generally well received. Attitudes ranged from adamant refusal and some skepticism "people could be partial" by one respondent to a "possibility it would eliminate a lot of these rogue builders" by another. Alternatively, there were "no objection" or "OK" replies with a little more enthusiasm shown by a "yes" answer, and finally finishing with "a good idea" Some Building Control Officers thought that as the scheme would rely on feedback from Home Owners and situations could arise where a Builder might get a bad report because of disputes between the parties which had nothing to do with competence and good workmanship.

Major concerns amongst actors were difficulties regarding impartiality and the existing relationships that Building Control Officers have with Builders. “We would get problems between Builders,” said one Officer. “I think it would be difficult to police,” explained another agreeing with this previous statement. A different inspector thought “you may find then you are upsetting Builders you have good relationship with”. Additional comments included “but we have to be impartial” and “it is a risk assessment.” In the six districts investigated it appeared the inspectorate in two areas was in favour, two reacted negatively and a further two were neutral. No respondents mentioned the possibility that dissatisfied Builders or indeed clients might have recourse to the Ombudsman, or there could be potential allegations of favouritism and corruption. Overall opinions though diverse were basically unfavourable amongst the regulatees.

This proposal is unlikely to find favour with most regulators and has no support amongst regulatees. The production of substantial favourable evidence would be required to show this scheme might be a way forward. The Builders involved in the scheme may well be highly proficient but technical complications and unexpected difficulties could still arise. The expertise of the Builders may highlight these difficulties earlier in the project but it does not substantially address the problems that cause these issues arising in the first place.

Appendix 9 standard details and regulations for domestic extensions

Home Owners were not questioned on this subject as it appertains to a specialist area of the Building codes which the lay persons interviewed had no knowledge or interest.

Ensuring that *Designers* can be assisted in the understanding of the Building Regulations has been considered a way the service might be improved Building Regulations Advisory Committee (2007). Enhancing knowledge of the requirements of the codes it is claimed would aid better design and ensure a superior end product. Suggestions that central government should publish standard details for domestic extensions (Communities and Local Government, 2012b) was put to Designers and the proposition was rejected except for a single interviewee who agreed “it was a good idea for clients who were not employing a Designer”, “A lot of Building Control Officers deal with private people, but a lot of people haven’t any idea”. The remainder of replies ranged from, “I’m a bit dubious” to “I don’t think so.” There is a possibility of vested interests on the part of Designers regards this issue because the publishing of standard details might encourage the submission of “do it yourself plans. However, these suggestions might well prove beneficial for resource allocation in domestic extension projects if it improves the quality of drawings and specifications.

To help small *Builders*, the Central Government expressed the possibility of publishing a basic and alternative set of Building Regulations specifically for domestic extensions (Communities and Local Government, 2009a). This proposal did not receive enthusiastic support from the Builders interviewed for they were quite content with the current Approved Documents and did not think that this idea would aid them in constructing small projects more

effectively. One Builder said that “it might make things easier” whilst another stated he would “still require drawings to work to”. The majority was against the idea and maintained it would induce more bureaucracy. On a separate issue the subject concerning difficulties in obtaining the relevant information regarding the building codes was raised, all respondents replied there they had no concerns or difficulties in accessing regulatory data and this was not regarded as a problem.

Building Control Officers’ were united in rejecting the proposal of standard details for domestic extensions even though Central Government is committed to improving Building Control Services (Communities and Local Government 2008a), and the publication suggests this as a way forward. Their views were that “each domestic extension is unique and that the regulations are changing all the time”. The government proposals were “a manual of how to build relying on Local Authority to undertake the training and instruction presentations”. They thought there were enough “Approved Documents already,” “why change things”, and “a little knowledge can be dangerous.” “There are other suggestions a foot to explain the building Regulations better.” “They might think any guidance is better than none” and “interpretation amongst Building Control Officers does sometimes vary.” In general, the inspectorate thought the “Approved Documents were well explained already,” “there is information on the planning portal”, and “a wealth of details on the web.” “It may feasibly cause more problems and difficulties for Building Control Officers because this measure might lead to an increase in non-professional applications,” summed up the general regulatory attitude. There was unanimity amongst Officers that such a proposal would make little difference to the outcome of domestic extension projects

Standard details potentially could make life easier for Designers and simplify some construction details for Builders. However, choice of materials and innovation would be compromised and there is no call for this proposal within the industry generally It 's hard to see how the premise would prevent

the most common difficulty, technical complications, arising. If this scheme came to fruition its impact on reducing extra resource allocation would be negligible.

Appendix10 planning influence

Two out of the six *Home Owners* indicated they had trouble and difficulties gaining Planning Permission and a further two had some form of contention with the Planning department. Three of the six respondents believed that Planning and Building Regulations permissions were the same thing, one was unsure whilst the remaining two were aware of the distinction. Home Owners lacked command over the processes of determining between public and private control because the responsibility of choice of inspector rested with Designers in all six projects.

Difficulties experienced by *Designers* with the Local Authority Planning departments were a cause of some anguish for them. The researcher thought this discontent might possibly manifest reasons why Designers might refrain from dealings with other departments within Local Authority and look to alternative bodies for approval and inspections. However, this was not the outcome experienced, without exception Designers were acutely aware of the differences between Planning and Building Control departments. It was the relationship and the kind of service they received from Local Authority Building Control bodies that affected their decision to negotiate with those units. In answer to the query, “did dealing with the Planning department put you off Local Authority Building Control?” Replies such as “no it hasn’t actually,” or a straight “no”, were the dominant responses.

All *Builders* were aware of the difference between planning laws and building codes. When the subject of planning arose they were emphatic their dealings with the Planners had not coloured their opinions Building Control. There was an appreciative understanding and high regard for Local Authority Building Control in comparison with other local public sector departments. This view reflected the acknowledgement of the repartee

between Builders and Officers through remarks such as “it is easier to deal with Building Control” or “they can’t be held responsible for the Planners”.

Building Control Officers opinions differed over the influence that Planners relationships with actors involved in domestic extensions have. A regulator responded that Building Control in his particular Authority worked closely with their Planning department and indicated there were no problems concerning this issue. A contradictory opinion was expressed by a different Building Control Officer who mentioned he had lost custom because of the attitude of Planning. “Some clients have not chosen Local Authority Building Control and would rather deal with private sector control than have further dealings with the council.” Another interviewee admitted certain sourness between the two departments. The remainder thought that at least some actors’ attitudes towards Local Authority Building Control were influenced by Planners which could have a negative impact on parties involved in a project. There was no empirical evidence on which to ground the loss of custom and these sentiments of negativity. The general disposition amongst Building Control Officers about Planning officials was summed up by one interviewee who said: “we are all tarred with the same brush.”

The actions of Planning departments may influence actors’ choices in the selection of public sector Building Control but there is a lack of documentary evidence or research to support this notion. In districts where both departments have amalgamated there does not appear to be a problem. In areas where the two departments function separately, it depends on the attitude and working practices of the Planning unit whether their actions are perceived to affect customers to an extent they seek their Building Control requirements in the private sector. Builders and Designers are aware of the differences between the units and this has not influenced their use of public Building Control. Even if some loss of custom to Authorities did occur this would not impact on unexpected resource allocation because these issues are entirely separate. The interviews do reveal that a change of attitude in

some Planning departments would alter public perception of that Local Authority in general.

Appendix 11 fee scales and value for money

Questioned if the service provided was value for money, four *Home Owners* said “yes,” one said “OK, whilst another shrugged his shoulders. It does not appear that clients believe they are being overcharged or the current fee levels are regarded as exorbitant. When asked about the suggestion for a national fee scale they expressed negative opinions and thought the idea irrelevant. As with most consumer goods, people would rather not to have to pay a fee for the service and prefer things to be cheaper than they are. Other concerns regarding fees arose from various Home Owners mainly about fee charges which often they thought they had already paid when they were billed for their Planning permission.

One *Designer* suggested a national fee scale would save having to assess the fee tables in each district in which they make an application. His belief that a national fee scale would be a good idea had a caveat, “only if it was cheaper”. This would result in a return to how things were nearly thirty years ago when the central Government set the scale. Generally, Designers were indifferent to this measure with “not bothered,” “you can see the fee scale online,” and “it doesn’t really matter” being a common response. When the subject of the reasonableness of the fees was broached a lone respondent thought they had gone up massively whilst others thought they were satisfactory with comments such as “we don’t pay it,” “better than Planning,” and “we negotiate.” Fee scales did not appear to be an issue with Designers’ who generally believe the present fees are value for money.

Builders had little enthusiasm for a national fee scale as it was felt that it was not something that concerned contractors. Questioned about the reasonableness of the fees, Builders gave indifferent responses, a typical reply being “it’s not down to me.” The same attitude prevailed regarding

value for money; fee charges not usually being their concern. Primarily Builders were not involved in this aspect of the contract; which was usually dealt with by Designers and occasionally Home Owners.

The entire cohort of *Building Control Officers* agreed a national fee scale would be a retrograde step. They thought it would not ameliorate problems concerning domestic extension projects and probably compound them. Some said it might work at a lower tier of governance, "it might be OK regionally as other factors are involved" or as another added "regional offices have a certain amount of negotiating power." The consensus was that fees set by their own bodies were the optimum way forward because of "area size, densities and pay scales". Agreement with this particular response was reiterated with comments such as "we are condensed in a town - our inspection fees can be less", and "local fee setting is a good thing." Other arguments included "it would result in cross subsidisation occurring and present difficulties for departments to operate within the profit and loss margins of plus or minus five percent" and "would be an impediment in reducing additional resource use".

The introduction of a national fee scale could make application procedures marginally easier for Designers but would be of no advantage to Builders or Home Owners. Building Control bodies would object to the loss of the right to set their own charges and would reduce the possibility of conforming to the Government's resolution in preventing cross subsidisation because costs of travel, employment, and overheads vary from district to district. In the absence of localised fee setting the requirement to maintain budgets within the plus or minus five per cent parameters would present a formidable obstacle to overcome. Documentary evidence shows clearly that Building Control bodies set an average fee for domestic extensions rather than a price for each individual project and that the loss of autonomy in fee setting would lead to

significant variations in losses or surpluses in individual Authorities' budgets. Most importantly national fees do not address the issue of the problems specific to domestic extension cost overruns.

Appendix 12 extra fee charges

The provision for extra fee charges (Building (Local Authority Charges) Regulations 2010) was implemented during the period of the current research programme as a measure to overcome resource overruns. *Home Owners* when asked about the provision within the regulations to charge extra fees if extra Building Control resources had been used because of unforeseen circumstances not consequential to Building Control, some were surprised to learn of this provision, the remainder thought it fair and reasonable. There was a consensus that bringing in this regulation was equitable and was a sensible provision especially as there is also a stipulation to offer a refund of fees in the event of a reduced service delivery. Home Owners were unsure how charging for extra work would affect them, though agreeing the core principles of the change seemed fair.

When *Builders* were asked about this provision they were surprised as none of the contractors had heard of the change in the law but they thought it fair and reasonable. There was a consensus that bringing in this regulation was equitable especially as there is a stipulation to offer a refund of fees in the event of reduced service provision. Their assumptions were summed up by one Builder's retort "why should the tax payer have to pay".

Designers interviewed were more circumspect. Typically views were along the lines of "I have never known it happen," "I wasn't aware," and "I've never heard of that," "wouldn't agree with that" being a sample of the comments, demonstrating a lack of awareness of this provision. Support for refunds was mixed, "a good idea," "I would agree with that", contrarily "I wouldn't agree with that" being a sample of their comments.

The change in the fee charging regulations was greeted with approval by *Building Control Officers* though none of the Authorities had enacted this

provision for charging though some had reimbursed clients who had not carried out all of the works intended. “We have made refunds when people haven’t done some of the work,” “jobs that have gone over vastly, we ought to start recharging”, and “we haven’t made use of it yet.” Part of the economic resource use problem, unique to Building Control, is departmental recharging to the Local Authority finance department for enforcement action. Fees received for any project would not sustain the legal enforcement action costs and in law (Building Act 1984) are entirely separate financial functions of the Authority. Although legal redress to seek compliance is rare it does produce budgetary implications. When questioned directly on this specific issue some of the regulators hedged and stated “we haven’t done any enforcement for a long time,” or “we don’t go to court.” When pressed further it was acknowledged that that if the surveyors recharged their time back to the Local Authority their “legal (department) would recharge for their work, therefore, Building Control costs would rise.” Similar constraints were evident in another Authority “there is a certain amount of enforcement which is paid for out of (our) the budget- that is the budget it has to be taken out of.” This view was reiterated elsewhere “I am not sure how much money we get back but it must be something.” These statements endorse evidence of a general trend that enforcement costs are met, at least partly, from Building Controls’ departmental resources and not from Authorities’ legal departments.

Provision for recharges to the client for extra work by Building Control Bodies (Building Regulations, 2010) has been sparsely used. Local Authorities legal departments appear apprehensive to engage this facility due the potential for counter litigation. Finance departments believe the work involved in the collection of additional fees could be prohibitive and therefore, self-defeating. Heads of Building Control departments thought it might lead to bad publicity and a souring of future relationships. No documentary evidence has yet surfaced either to support or reject the positions held by the relevant departments of the various Authorities on the resultant use of this provision. If future practical improvements fail to stem

excessive site inspection obligations but the responsibility for supplementary visits can be determined then the use of this measure would help prevent cross-subsidisation from one project to another. If the legislation was widely published it could act as a potential deterrent and encourage preventative action that might potentially lead to a reduction in resource use overruns. All respondents except some Designers thought this was a fair piece of legislation.

Appendix 13 summary of extra inspections caused by Home Owners

Summary of alterations required by the Home Owner which caused extra inspections for Local Authority Building Control

1. District 1. Change of all windows and doors from timber to uPVC after installation of wooden windows.

Note this was a change that required a new application under Building Regulations and so incurred additional fees.

2. District 5. Switch to a heavier roof covering materials which necessitated increased structural support.

In district one, the Home Owners alterations increased the Building Control department's income. There were supplementary fee charges due to the modifications demanded by the change from timber to uPVC frames which required additional thermal regulations compliance. The extension in district five the Home Owner changed the roof covering which required an extra site inspection due to increased structural strengthening for additional loadings. This could be justifiably counted as an increase in resource use. The project files gave no breakdown in time or costs to the units for this extra activity therefore; financial resource overruns could not be accurately calculated. .

Appendix 14 summary of mistakes caused by Designers

Summary of mistakes by the Designers which caused extra inspections and office work for the Local Authority Building Control:

1. District 1. The Designer failed to note the existing wall was non-load bearing.

2. District 1. The Designer could have checked the ground bearing capacity of the soil and designated the correct foundation depths though he was not necessarily obligated to do so.

3. District 1. The survey showed the first-floor window cill heights differently to what they were in reality, which meant the height and pitch of the extension roof would have to change because it would not conform to the regulations.

4. District 3. The survey drawing gave the length of the extension incorrectly by a margin of three metres.

5. District 3. The Designer should have checked if the undermining of the existing foundations would occur if his excavation depth details were carried out as shown on his drawings.

Note the Designer could also have checked the adequacy of the existing drainage and the soak away positions, though he was not obliged to show them on the drawings.

6. District 4. The depth of the current drainage system was not determined which resulted in much deeper foundations being required to prevent the transfer of loading on to the drains.

7. District 4. The depth of fill required to the oversite was incorrect resulting in either a change of thickness to the retaining wall or change from a concrete oversite to a suspended flooring system.

8. District 4. The structural opening into the existing house was detailed too narrowly concerning the proposed fitted kitchen furniture layout.

9. District 4. The wind post design was unnecessary, resulting in time wasted by the inspectorate in checking calculations.

10. District 5. Extra insulation was required as compensation for heat loss from the extension.

11. District 5. The adjoining property boundary condition was not shown on the drawing, resulting in a requirement to fire proof the structural elements

12. District 6. The foundations had to be reinspected as the ground was not shown on the drawing as sloping and the foundations had to be stepped. Note the Designer did not need to specify radon protection to the garage area which resulted in an unnecessary cost to the Home Owner.