Leicester
City Council

**WARDS AFFECTED**
All

**FORWARD TIMETABLE OF CONSULTATION AND MEETINGS:**
**Overview & Scrutiny Management Board** **4 March 2010**
**Cabinet** **8th March 2010**

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# Meeting Climate Change and Sustainability through Construction (New Build and Major Refurbishment)

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**Report of the Strategic Director, Development Culture and Regeneration**

## 1. PURPOSE OF REPORT

1.1 An approach is needed to ensure that during the design of new council buildings and major refurbishments the carbon dioxide emissions performance is considered to meet the One Leicester commitment to build zero carbon buildings. In addition, the approach should also cover other corporate environmental objectives (eg. waste, water use etc) and the council's wider sustainable procurement policy that considers issues such as ethical sourcing.

## 2. SUMMARY

2.1 Adopting the BREEAM (the Building Research Establishment Environmental Assessment Methodology) suite of environmental construction standards for new council buildings and major refurbishments will ensure that major council building projects achieve higher environmental standards and produce less carbon dioxide.

2.2 An accompanying Sustainability Assessment will consider the non-environmental aspects of the corporate sustainable procurement policy (ie. issues around ethical sourcing and impact on the local community etc).

2.3 By incrementally improving the carbon dioxide emissions performance of new buildings, the council will prepare itself for the forthcoming zero carbon target dates set at 2013 in the One Leicester document and nationally by government at 2016 for schools and 2019 for all other non-domestic buildings.

2.4 The approach will also contribute towards achieving the corporate environmental improvement targets under EMAS (eg. carbon dioxide, energy, water, waste etc), improved performance under NI185 *carbon dioxide emissions from the council's own operations* and provide external credibility to council building projects.

2.5 There will be an increased capital cost associated with achieving higher environmental standards. For indicative purposes a new primary school achieving BREEAM "excellent" could cost an additional 5.9% to 9.85% and secondary school 3.9% to 4.4%.

2.6 It is anticipated that there will also be an extra design fee cost associated with the time required for collecting and submitting the evidence for the BREEAM assessment and the extra design work to achieve the higher environmental standards. However, there is currently no information to indicate what this cost might be. Internal staff who are currently designing to BREEAM are recording their time on these tasks under a specific code. An assessment will be made when enough projects have been completed.

2.7 The cost of undertaking the BREEAM assessment and registration for a primary school would be approximately £16,000 with an additional £5,000 for a carbon dioxide emission reduction feasibility study.

2.8 There will be ongoing revenue savings from lower energy and water costs, and reduced payments under the Carbon Reduction Commitment. Some types of energy conservation investment, such as increased insulation and better lighting controls, can have a short pay back period. Other types of investment, such as photovoltaic cells, have a much longer payback period and it would be difficult to ring fence revenue savings to pay for these options.

## 3. RECOMMENDATIONS

3.1 It is recommended that all new council building and major refurbishment projects that fall within the council definition of a major project (ie. over £1,000,000):

i. will be expected to achieve the BREEAM Design standard environmental rating of "excellent" on new buildings and seek funding to meet this standard as required. Major refurbishment projects are required to achieve "very good" where BREEAM is appropriate to the nature of the refurbishment (see Appendix 1 for an explanation of BREEAM ratings);

ii. undertake a feasibility study as part of BREEAM to present a series of costed options for achieving different levels of carbon dioxide emissions reduction to an appropriate financial decision-making forum (eg. Cabinet); and

iii. are subject to a Sustainability Assessment to pick up the non-environmental aspects of the council's sustainable procurement policy (ie. issues around ethical sourcing, impact on the local community etc).

3.2 In circumstances where there are existing legal or other requirements applicable (eg. planning policies) then these will take precedence. An example would be the refurbishment of a council-owned listed building.

3.3 The recommendations will be implemented through the corporate project management standards and the Gateway process.

## 4. REPORT

### 4.1 The BREEAM environmental construction standard

4.1.1 BREEAM (the Building Research Establishment Environmental Assessment Methodology) is a widely used suite of environmental construction standards.

4.1.2 BREEAM standards cover most common building types including offices and schools. The BREEAM Design assessment rates a building design from 'pass' through to

'outstanding'. The rating is based on an overall score that is calculated by awarding credit scores to a wide range of environmental issues. An explanation of BREEAM ratings is provided in Appendix 1. The assessment is undertaken by an independent, qualified assessor and the BREEAM certificate is issued by the Building Research Establishment (BRE) on project completion.

4.1.3 The requirement for a BREEAM Design 'excellent' rating on new buildings and 'very good' on major refurbishments is now common practice. These are the requirements for Leicester's Building Schools for the Future (BSF) phase 1 schools and the Primary School Capital Programme. These requirements for 'excellent' should be extended to all new council buildings. Major refurbishments that fall within the council definition of a major project (ie. over £1,000,000) should be required to achieve "very good" where BREEAM is appropriate to the nature of the refurbishment.

4.1.4 The City's new Digital Media Centre has been built on budget and will achieve BREEAM "very good". This demonstrates that higher environmental standards can be achieved within budget through good design. However, even higher levels of environmental performance will be required to meet the aspirations of One Leicester and the corporate environmental targets. The additional capital costs associated with achieving BREEAM ratings are detailed in the Financial Implications section.

4.1.5 As part of the BREEAM certification process a building project will need to be assessed by a qualified, independent assessor and registered with the BRE. The cost for an office or a school should not exceed approximately £16,000.

4.1.6 Planned building projects that are likely to be affected by this policy if they go ahead are the replacement/refurbishment of New Walk Centre and the new bus station.

**4.2 A carbon dioxide emission reduction feasibility study**

4.2.1 Research recently commissioned by the Primary Capital Programme Manager to support the current school building programmes concluded that of three city schools investigated only one could have been built to achieve zero carbon at reasonable cost. However, it would have been possible to achieve a 60% reduction in carbon dioxide emissions on all three (based on 2002 Building Regulation requirements). The research therefore suggests that at the moment it would be too expensive to build all new council buildings to zero carbon but considerable improvements in the carbon dioxide emissions are possible at a reasonable cost as detailed in the Financial Implications section.

4.2.2 Achieving zero carbon on major refurbishments is generally not realistically possible but again improvements in the carbon dioxide emissions are possible.

4.2.3 In order to support this new council buildings and major refurbishments that apply BREEAM should be required to undertake a feasibility study to present the various options for reducing carbon dioxide emissions. The study should also present members with the associated capital costs to support financial planning. This approach provides a clearer understanding of the financial implications of design decisions and is flexible enough to accommodate the individual nature of different building projects.

4.2.4 The approximate cost for a feasibility study would be £5,000 on top of the usual building services consultant design fee.

### 4.3 Sustainable Procurement Policy

4.3.1 One limitation of the BREEAM standards is that they do not cover all aspects of the council's Sustainable Procurement policy. However, the new project management standards include a requirement for a Sustainability Assessment to be carried out. This will be carried out by the Sustainable Procurement officer based in the Environment Team. The BREEAM assessment will pick up the environmental aspects of building projects with the Sustainability Assessment picking up the remaining aspects of the Sustainable Procurement policy (ie. issues around ethical sourcing and impact on the local community etc).

### 4.4 The Benefits of the Proposed Approach

4.4.1 One Leicester contains a commitment to ensure that "From 2013, every new building in Leicester will be zero carbon" and to "make sure the buildings being planned as part of public sector programmes are visible and inspirational exemplars of zero carbon construction." The proposed approach will support progress towards the One Leicester commitment by delivering new council buildings and major refurbishments that produce less carbon dioxide. The council should aim to incrementally improve the carbon dioxide emissions performance of each new council buildings in order to work toward the One Leicester commitment.

4.4.2 In addition to the One Leicester commitment, the government has already suggested zero carbon target dates for new schools (2016), all other new public sector buildings excluding local authorities (2018) and all other non-domestic building including local authorities (2019). The council should aim to incrementally improve the carbon dioxide emissions performance of new council buildings in preparation for the zero carbon target dates.

4.4.3 The Council's carbon dioxide emissions are now scrutinised annually under National Indicator 185 and the proposed approach would improve the council's performance on this indicator.

4.4.4 The council has several corporate environmental objectives identified under EMAS. BREEAM will help to deliver targets relating to carbon dioxide emissions, energy use, water use, waste generation, the generation and use of renewable energy and the number of schools with wildlife areas.

4.4.5 Financial savings will result from lower energy running costs as detailed in the Financial Implications section below although these would not provide a payback over the lifetime of the project for some types of investment (eg. photovoltaic cells).

4.4.6 Finally, BREEAM is a widely recognized, rigorous and externally assessed standard that provides additional credibility to Council building projects.

## 5. FINANCIAL, LEGAL & OTHER IMPLICATIONS

### 5.1 Financial Implications

5.1.1 Achieving a higher BREEAM rating has an associated capital cost. The BREEAM ratings recommended in this paper are already a requirement for school buildings. But applying the ratings to other new council buildings and major refurbishments will cost

more money. The exact amount depends upon the nature of the specific project and the only research available, conducted by Faithful and Gould (2008), relates to schools. For indicative purposes a new primary school achieving "excellent" could cost an additional 5.9% to 9.85% and secondary school 3.9% to 4.4%.

5.1.2 It is anticipated that there will also be an extra design fee cost associated with the time required for collecting and submitting the evidence for the BREEAM assessment and the extra design work to achieve the higher environmental standards. However, there is currently no information to indicate what this cost might be. Internal staff who are currently designing to BREEAM are recording their time on these tasks under a specific code. An assessment will be made when enough projects have been completed.

5.1.3 At the moment it would be too expensive to build all new council buildings to zero carbon but considerable improvements in carbon dioxide emissions are possible (Faithful and Gould, 2008). The Primary Capital Programme Manager has estimated that a 60% reduction based on 2002 Building Regulations is possible at an additional cost of 8% for a new primary school and 4% for a new secondary school. In relation to refurbishments around a 50% reduction is possible, typically at an additional cost of 8% to 10%. However, the individual nature of different building projects makes it difficult to adopt a set carbon dioxide emission reduction figure for all of them. The proposed approach uses a feasibility study to present members with a series of costed options for achieving different levels of carbon dioxide emissions reduction. This approach provides members with a clearer understanding of the financial implications of design decisions and is flexible enough to accommodate the individual nature of different building projects.

5.1.4 Adopting the recommendations would also mean that individual projects would incur the cost of undertaking the carbon dioxide emission reduction feasibility study and the BREEAM assessment and registration. An example cost for a new primary school would therefore be approximately £21,000 made up of £16,000 for BREEAM and £5,000 for the feasibility study. This cost would need to be part of the project budget.

5.1.5 Lower running costs will result from lower energy use. Some types of investment such as increased insulation and better lighting controls can have a short pay back period. Other types of investment, such as photovoltaic cells, have a much longer payback period. Research by Faithful and Gould (2009) has estimated that by increasing the energy conservation properties of the structure of Beaumont Leys Community College then £1,379 could be saved per annum and by introducing a ground source heat pump along side a 40kW gas boiler and 100 $m^2$ of photo voltaic cells then another £4,000 could be saved. However, the payback periods for these two options are currently 65 years and 87.5 years respectively. These payback periods would not allow savings to be used as funding mechanisms. Two BREEAM credits are available where Life Cycle Costing is applied to the building (section Man 12) in order to establish the total cost of the building for acquisition, operation, maintenance and disposal across different design options. This approach formalises the relationship between up front costs and ongoing costs in decision making. The technique is currently being applied to the rebuild of Mellor Community Primary School and if successful the Life Cycle Costing BREEAM credits could be made mandatory for all council building projects where applicable.

5.1.6 Financial savings will also arise as a result of lower costs associated with the Carbon Reduction Commitment (CRC) which is a cap and trade scheme for carbon dioxide emissions starting in 2010. The purchase of the first two years worth of allowances for the CRC could cost the council an estimated £1.6 million. The first purchase will be made in April 2011. If the council then needs to increase its emissions allowances, because it emits more $CO^2$ than agreed, then it would have to be pay more. If emissions were reduced then there would be a refund. The cost of $CO^2$ has been set at £12 per tonne for the first 3 years of the scheme and will then increase.

5.1.7 Given the above, the basic financial implication of adopting higher environmental standards is that the capital cost will increase. Longer term savings in running costs would be made but some of the options for achieving this would be difficult to ring fence for funding proposals at the moment.

*Martin Judson, Head of Finance, Ext 297390*

**5.2 Legal Implications**

5.2.1 There are no legal implications. However, it is likely that from 2016 all new schools will be required to meet a 'zero carbon' standard. All other new council buildings will be required to meet a similar standard from 2019.

*Jean Geary, Principal Contracts Officer, Ext 296357*

**6. Other Implications**

| OTHER IMPLICATIONS | YES/NO | Paragraph references within the report |
|---|---|---|
| Equal Opportunities | No | |
| Policy | Yes | The adoption of BREEAM will provide a way of ensuring that the corporate environmental policy is implemented when new council buildings are constructed and major refurbishments undertaken. |
| Sustainable and Environmental | Yes | BREEAM is a construction standard that was developed to improve the environmental performance of new buildings and major refurbishments. |
| Crime and Disorder | No | |
| Human Rights Act | No | |
| Elderly/People on Low Income | No | |

**7. RISK ASSESSMENT MATRIX**

| Risk | Likelihood L/M/H | Severity Impact L/M/H | Control Actions (if necessary/or appropriate) |
|---|---|---|---|
| 1 – Failure to meet the One Leicester commitment that "From 2013, every | H | M | BREEAM may form the basis of a future sustainability code |

| | | | |
|---|---|---|---|
| new building in Leicester will be zero carbon". | | | for non-domestic buildings which will require a zero carbon requirement. |
| | L - Low<br>M - Medium<br>H - High | L - Low<br>M - Medium<br>H - High | |

## 8. BACKGROUND PAPERS – Local Government Act 1972

- www.breeam.org
- One Leicester – Shaping Britain's sustainable city (2008).
- Carbon Reduction Commitment, Cabinet Briefing (4th Nov 2008).
- Putting a Price on Sustainable Schools (2008) Faithful and Gould.
- Carbon Neutral Schools Research Study for Leicester City Council (March 2009) Faithful and Gould.

## 9. CONSULTATIONS

| Consultee | Date Consulted |
|---|---|
| Jim Bowditch, Capital Programme Manager, CYPS | Sept 2009 |
| Neil Gamble, Head of Property Development | Sept 2009 |
| Reducing Our Carbon Footprint Priority Board | 9th Sept 2009 |

## 10. REPORT AUTHOR

Mark Jeffcote
Senior Policy Officer,
Environment Team.
X296765

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|---|---|
| **Key Decision** | Yes |
| **Reason** | Is significant in terms of its effect on communities living or working in an area comprising more than one ward |
| **Appeared in Forward Plan** | Yes |
| **Executive or Council Decision** | Executive (Cabinet) |

## APPENDIX 1 – BREEAM Ratings and Scoring

Buildings assessed under BREEAM are rated as follows:

| BREEAM Rating | BREEAM Score |
|---|---|
| UNCLASSIFIED | <30 |
| PASS | ≥30 |
| GOOD | ≥45 |
| V GOOD | ≥55 |
| EXCELLENT | ≥70 |
| OUTSTANDING | ≥85 |

An example of how a BREEAM score for a fictitious building is calculated is presented in the table below.

| BREEAM Section | Credits Achieved | Credits Available | % of Credits Achieved | Section Weighting | Section Score |
|---|---|---|---|---|---|
| Management | 7 | 10 | 70% | 0.12 | 8.40% |
| Health & Wellbeing | 11 | 14 | 79% | 0.15 | 11.79% |
| Energy | 10 | 21 | 48% | 0.19 | 9.05% |
| Transport | 5 | 10 | 50% | 0.08 | 4% |
| Water | 4 | 6 | 67% | 0.06 | 4% |
| Materials | 6 | 12 | 50% | 0.125 | 6.25% |
| Waste | 3 | 7 | 43% | 0.075 | 3.21% |
| Land Use & Ecology | 4 | 10 | 40% | 0.1 | 4% |
| Pollution | 5 | 12 | 42% | 0.1 | 4.17% |
| Innovation | 1 | 10 | 10% | 0.1 | 1% |
| **Final BREEAM Score** | | | | | **55.87%** |
| **BREEAM Rating** | | | | | **V GOOD** |

In addition to achieving the required score, each rating also has mandatory credits that must be achieved. For example, the mandatory credits for V GOOD are:

| BREEAM Credit Set | Mandatory Number of Credits |
|---|---|
| Man 1 - Commissioning | 1 |
| Hea 4 – High frequency lighting | 1 |
| Hea 12 – Microbial contamination | 1 |
| Ene 2 – Sub-metering of substantial energy uses | 1 |
| Wat 1 – Water consumption | 1 |
| Wat 2 – Water meter | 1 |
| LE4 – Mitigating ecological impact | 1 |

Assuming the fictitious building above achieved the mandatory credit requirements then the final BREEAM score of 55.87% would have achieved a V GOOD rating.