# Procedures for using SBTool 2007

iiSBE



## General

| | | Who | Done |
|---|---|---|---|
| 1 | Open the zip file | A | |
| 2 | Open the three files in sequence - A, B then C. | A | |
| 3 | Re-name each file in sequence. | A | |

*Note: In the "Who" boxes, A indicates the third party responsible for establishing regional settings, B indicates the design team and C indicates Assessor.*

*Make sure that the name for the A file contains the name of the region, while the B and C files contain the name of the specific project. For example, the A file might be called "SBT07_A_London_Office_V1.xls", while a B file might be titled "SBT07_B_AmexHQ_V1.xls, and the C file could be named "SBT07_C_AmexHQ_V1.xls.*

## Procedures related to File A

*File A is intended to establish context information, weights and benchmarks related to a generic project type in a specific region. In a setting where SBTool is used for commercial assessment, the information required for File A is to be provided by parties who have no connection with or interest in a specific project. Another aspect of the nature of SBTool is that the default values used in the system (to show how it works) are meaningless for a particular application unless the system is first calibrated for the specific region and building type. This feature of SBTool means that there is extra work to do before it is used, compared to systems such as LEED or BREEAM. On the other hand, it also means that the A file can be used to assess many projects within a region, and the results will be considerably more relevant as a result of the calibration process.*

| | | | |
|---|---|---|---|
| 4 | Fill in the yellow fields in the Basic worksheet with required information. | A | |

*Required information includes the name of you're a File, the Region or City location, Country location, Contact name and e-mail. The last yellow cell is titled "Specify Local Content Name". This refers to the fact that the system allows third parties to change benchmark or other content and/or use a different language. A title for such a set of alternative information is therefore useful.*

| | | | |
|---|---|---|---|
| 5 | Select appropriate values from the pre-set values found with blue click boxes in the Basic worksheet. | A | |

*Key values to be selected include:*
*- selection of Generic or Local content;*
*- selection of Phase to be used (Pre-design, Design, Construction or Operations);*
*- Assumed lifespan of design in years: has obvious relevance for the annualized embodied energy and emissions;*
*- Amortization rate for embodied energy of existing structures: this is needed because we allow users to specify projects that include both new and existing elements;*
*- Set minimum score for Mandatory items: a few parameters have a mandatory minimum score, and authorized third parties can set the minimum level;*
*- A few parameters are applicable to large projects, but the definition of "Large" varies;*
*- Similarly, the definition of what is a tall building varies. and should be locally defined;*
*- Three click-boxes allow up to three occupancy types to be selected from a pre-defined list;*
*- The Renovation click box is used to alert the system to the inclusion of renovation elements, which enables or disables certain parameters;*
*- Another click box allows users to specify whether the project includes building elements, or only urban planning elements;*
*The final click box permits the specification of ranges of numbers of dwelling units.*

| | | | |
|---|---|---|---|
| 6 | Go to the Context worksheet and select appropriate values from pre-set values. | A | |

*The Context worksheet allows third parties to identify specific conditions in their region or urban area that might affect the way that weights or benchmarks should be established. As in other parts of the system, blue click boxes allow third parties to select from a pre-defined list of conditions. In most cases, the selected values are for information only, but in a few cases, there is a direct link to weighting formulas that affect the weight for one or more parameters (e.g. Context items 11 or 12).*

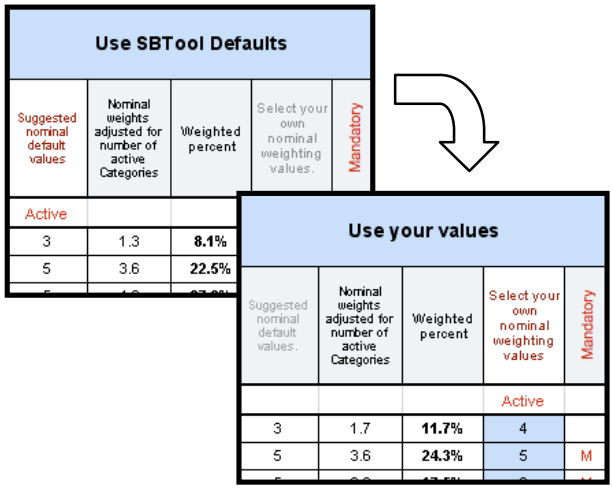
## Procedures related to File A, continued

7 Go to the WtA worksheet to select Issue and Category weights. A

*The weighting of SBTool parameters occurs at three levels, and weights indicate the relative importance of active parameters throughout the system. This worksheet provides weights for the two top levels, Issues and Categories. Note that all weights are chosen from a range of 0 to +5, except for those Issues or Categories marked with an "M", for Mandatory. In such cases, the selection range is limited from +3 to +5.*

*The default and neutral weight is +3 (mid-range) and this is used in the default settings, except for a number of parameters that are considered to be of fundamental importance, such as energy or loadings.*

*SBTool operates on the basis that weights within a group (whether Issues, Categories or Criteria) are re-distributed if one or more individual weights are changed, so that the total of weights always equals 100%.*




8 Review the default Issue weights (A to G) in the WtA worksheet and decide whether to use the default values or to use your own. A

*Consider that benchmarks have to be developed for all active Criteria, so there is logic in considering reducting the total number of Issues and Categories to be included in your assessments. Weights should be adjusted up or down depending on the relative importance of the parameter for the building type and the region. Clearly, it would be desirable to have a purely scientific basis for such variation in weighting, but that is not possible for the highest-level Issue weights, and we have not yet found a way to achieve this in the second-level Category weights. Please bear in mind that although default weightings for the highest level Issues might be seen as havingsome universal relevance, the default weights for Categories are almost certain to require adjustment to suit various project types or regions.*

9 If you decide to use your own weighting values, first click on the large blue box the WtA worksheet and select "Use your own weights" The blue click boxes in Column G are then activated. A

*If you decide to use your own weighting values, ensure that the selection is made by a group of at least three persons with knowledge and skills in issues relating to sustainable building.*

10 Continue to enter weights for the Categories under each Issue area in WtA worksheet. A

*To decide on weights for the Categories, the selection of knowledgeable people to set the weights will of course depend on the type of Category. For example, the weightings for Categories within the Energy and Resource Issue areashould be established by a group of specialists in energy, materials and water, while those within the indoor Environmental Quality Issue require skills relating to ventilation, air quality, daylighting and noise/acoustics.*

11 Go to the WtB worksheet to select Criteria weights. A

*Weight assignments for Criteria are handled differently than for the upper two levels of parameters. One reason is that there a maximum total of 120 Criteria that could be active, and to assemble panels to assign weights for each one separately would be impractical. In view of these factors, it was decided to provide defaut weights that could be over-ridden by third parties if they so choose. To give some objective basisto these weights, a scale of 1 to 3 was used to indicate the estimated Extent, Intensity and Duration of effects of each Criterion. In addition to these adjustments, third parties can turn off the weight for individual Criteria if it appears to be inapplicable to the purpose of the assessments. In the example below, the weight for E.4 has been turned off, and the weights of E1. to E.3 are therefore automatically adjusted to total 100%. The value in the green cell at top right (19.4%) is the weight of the Category within which these Criteria exist, and the values in the right-hand column are the product of the Category weight and the Criterion weight, yielding the effective weight of each Criterion within the whole system.*

| | | | | E3 Controllability | | 19.4% | |
|---|---|---|---|---|---|---|---|
| ✔ | 2 | 3 | 1 | E3.1 | Provision and operation of an effective facility management control system. | 50.0% | 1.6% |
| ✔ | 1 | 2 | 2 | E3.2 | Capability for partial operation of facility technical systems. | 33.3% | 1.0% |
| ✔ | 1 | 2 | 1 | E3.3 | Degree of local control of lighting systems in non-residential occupancies. | 16.7% | 0.5% |
| | 1 | 2 | 1 | E3.4 | Degree of personal control of technical systems by occupants. | 0.0% | 0.0% |

## Procedures related to File A, continued

12 Go to the benchmark worksheets (BmkA to BmkG) to specify benchmarks. A

*All active Criteria in the system are found in the benchmark worksheets, and each worksheet contains all the Criteria for one Issue. All Criteria benchmark itemsfollow a standard format, including headings for the following:*
*- Intent*
*- Indicators*
*- Information sources*
*- Applicable project type*
*- Assessment method*
*- Applicable standards*
*- Information submittals (required by the party carrying out the assessment)*
*- Benchmarks, ranging from -1, 0, +3 and +5.*

*Third parties are to replace the default and generic benchmark values with ones that are relevant to their particular region and the occupancy type that the system is calibrated to assess. It will be found that there are two different types of values used: data that cover relatively objective parameter values, and text statements that attempt to describe, as objectively as possible, relatively subjective content. The example below shows a data-oriented benchmark.*

| Total project | Total project | m | Score |
|---|---|---|---|
| Negative | The height of the minimum elevation of the site above the elevation of the 100-year flood plain is : | 1.0 | -1 |
| Acceptable practice | | 1.3 | 0 |
| Good Practice | | 2.0 | 3 |
| Best Practice | | 2.5 | 5 |

*The illustration below is of a text-oriented benchmark, and below that is another that showsthe effect of different data benchmarks for two occupancies in the same project.*

| Total project | Total project | Score |
|---|---|---|
| Negative | The project is larger than the threshold area and contains one occupancy type. | -1 |
| Acceptable practice | The project is larger than the threshold area, and more than 90% of the total net building area consists of one occupancy type. | 0 |
| Good Practice | The project is larger than the threshold area and contains two major occupancy types, not including parking or service uses. | 3 |
| Best Practice | The project is larger than the threshold area and contains three or more major occupancy types, not including parking or service uses. | 5 |

| Occupancy 1 | Office | on | Percent pop. | Score |
|---|---|---|---|---|
| Negative | Design documentation indicates that the percent of the population expected to be served with bicycle storage will be equal to or more than : | | 10% | -1 |
| Acceptable practice | | | 25% | 0 |
| Good Practice | | | 70% | 3 |
| Best Practice | | | 100% | 5 |
| Occupancy 2 | Retail | on | Percent pop. | Score |
| Negative | Design documentation indicates that the percent of the population expected to be served with bicycle storage will be equal to or more than : | | 32% | -1 |
| Acceptable practice | | | 40% | 0 |
| Good Practice | | | 64% | 3 |
| Best Practice | | | 80% | 5 |

13 Go to the Emissions worksheet to calibrate emissions data and generation mix for power generation sources. A

*This worksheet contains data on various types of atmospheric emissions for fuels used on site (e.g. oil or natural gas), and for emissions generated at electric power generation plants. The specific mix of power sources feeding the grid that serves the project will determine the total amount of emissions generated. Because of the normally poor efficiencies of power generation plants, this may require the electrical energy delivered to the project to be multiplied by a significant factor (from 1.2 to 3.0) in order to properly represent the emissions from these primary energy sources. The primary energy factor is used automatically by SBTool to generate primary energy and emissions for electrical consumption.*

## Procedures related to File B

*The function of File B is to record information about a specific project, including basic data on number of occupancies, area, number of floors, and more detailed data on population, floor heights, area of naturally ventilated and mechanically conditioned space, and results of external calculations of energy performance. In addition, the file provides a Context worksheet that allows the design team to characterize the project and site, and an Embodied worksheet to provide a choice between approximate calculations of embodied energy and emissions, or to enter data from an external embodied energy calculation program.*

14 Go to the Basic worksheet to confirm (using the blue click boxes) that the proposed occupancies in the project are consistent with those established in File A. | B |

15 Go to the Context worksheet to provide context information about the project site and its immediate surroundings. | B |

*The Context worksheet in File A provides relevant information about the urban area, but this one is specific for the project. This worksheet contains several items that are directly linked to parameter weightings, including 19 (Agricultural value of site), 20 (Ecological value of site), 22 (Existing structures), 23 (Re-use of materials) and 24 (Heritage value).*

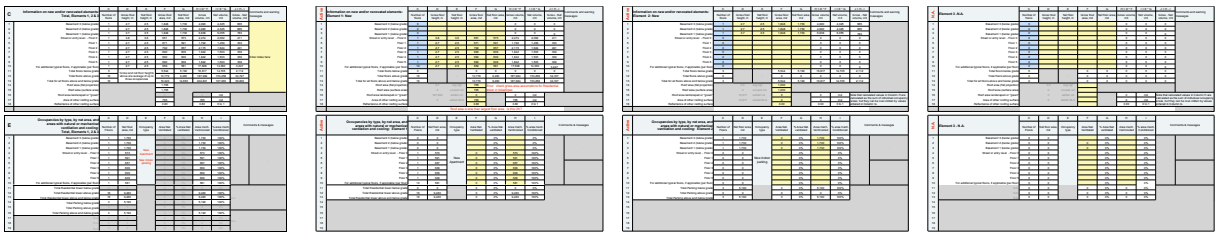
16 Go to the InitialSpec worksheet to provide basic information about the project. | B |

*The InitialSpec worksheet is designed to capture information about the project that is likely to be available early in the project development phase.The name of the project is entered (line 12) and selected occupancies are specified for up to three separate elements.*

17 Go to the DetailSpec worksheet to provide detailed information about the project. | B |

*The DetailSpec worksheet is designed to capture detailed information about the project that is likely to be available later in the project development cycle.Note that the worksheet is set up in 4 major vertical blocks as shown below. Obviously, Elements B and C are only relevant if the project contains three elements.*

Summary of all element data | Data for element A | Data for element B | Data for element C



*Data to be entered includes estimated populations and operating hours, number of floors gross and net areas, gross and net floor heights, areas of naturally and mechanically ventilated space, and energy consumption (either actual if in operating phase or predicted by a simulation program during the design phase.All these data are entered on an element-by-element basis.It should be noted that some data blocks are intended to be used for data on renovated or existing elements, while others are for new construction. These data are merged to provide total project data.*

## Procedures related to File B, continued

B

17 Go to the Embodied worksheet to develop results about embodied energy and emissions for the project.

*The Embodied worksheet provides users with an option to enter the results of an external program for calculation of embodied energy and emissions, or to use the very approximate internal model which provides predictions based on areas, volumes and energy intensities of materials for structural and the building envelope.*

*The illustration below shows the Embodied worksheet with the blue click box set for "Using values from an LCA program…". Note that in this setting, the two yellow cells (circled) are active. Five other cells provide space for heavy materials that used in the project but not part of the structure or building envelope.*

**Materials and Approximate Embodied Energy for Seoul Hirise, Seoul, Korea**

Title
Click to select value
Enter / revise text/data
Amortization rate used 5.0%

This worksheet can be used to give very approximate estimates of embodied energy for main structural and envelope components. Click on the blue box below to choose.

SBTool allows the embodied energy in existing materials that are re-used to be discounted according to their age. Thus, if an existing structure is 40 years old and an amortization rate of 5% is selected, the embodied energy is not included in the total for the project. See Basic worksheet to set the rate. All assemblies listed here are defined in EmbodiedA worksheet of Module A. Note that "X" means existing.

**Using values from LCA program --- go directly to Block J at end of worksheet**

| J | Total Embodied Energy of Structure, Walls, and Heavy Materials | Structure Net GJ | | Walls Net (without windows or glass) GJ | | Weight of heavy materials not included in Structure or Walls, in Tonnes | | | | | Total Embodied Energy | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Existing Elements | New Elements | Existing Elements | New Elements | Sand | Aggregate | Masonry | Steel | Glass | GJ / m2 & GJ /m2 * yr | MJ / m2 & MJ /m2 * yr |
| 1 | Estimated embodied energy, using values in this worksheet | 0 | 0 | 0 | 0 | 100.0 | 300.0 | 500.0 | 250.0 | 75.0 | **0.0** | **0** |
| 2 | Net GJ/m2 and MJ/m2 per year using approximations | | | | | | | | | | **0.00** | **0** |
| 3 | Estimated embodied energy results in GJ from external LCA program (existing elements at full value) | | 50,000 | | 30,000 | | | | | | Results using data from external LCA program | |
| 4 | With existing embodied energy values prorated down as per Basic worksheet | 0 | 50,000 | 0 | 30,000 | | | | | | **5.54** | **5,543** |
| 4 | Total net GJ/m2 and MJ/m2 per year from LCA program + heavy materials | | | | | | | | | | **0.07** | **74** |

*The illustration below shows the Embodied worksheet with the blue click box set for "Using approximate SBTool values". In this setting, there are several blocks of data to provide, including selection of structure and wall types using blue click boxes, and information on thickness and areas of walls to be entered in yellow cells.*

**Materials and Approximate Embodied Energy for Seoul Hirise, Seoul, Korea**

Title
Click to select value
Enter / revise text/data
Amortization rate used 5.0%

This worksheet can be used to give very approximate estimates of embodied energy for main structural and envelope components. Click on the blue box below to choose.

SBTool allows the embodied energy in existing materials that are re-used to be discounted according to their age. Thus, if an existing structure is 40 years old and an amortization rate of 5% is selected, the embodied energy is not included in the total for the project. See Basic worksheet to set the rate. All assemblies listed here are defined in EmbodiedA worksheet of Module A. Note that "X" means existing.

**Using approximate SBTool values**

| B | Structural Floors Beams and Columns Provided in New Structure(s) | Structural Floors | | | | Beams | | | | Columns | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Floor type | Thickness cm | Area, m2 | Floor Volume, m3 | Beam type | Aggregate length, m | X-section area, cm2 | Beam Volume, m3 | Column type | Aggregate X-section area, cm2 | Column Volume, m3 |
| 1 | Basement 3 (below grade) | | | 1848 | 4990 | | | | 0.00 | | | 2.70 |
| 2 | Basement 2 (below grade) | RC slab on grade | 8 | 1848 | 4990 | | | | 0.00 | RC column | 600 | 2.70 |
| 3 | Basement 1 (below grade) | RC slab | 16 | 1848 | 6838 | RC beam | 750 | 175 | 13.13 | RC column | 600 | 3.70 |
| 4 | Floor 0 | Precast slab | 16 | 651 | 2474 | Engineered wood beams | 750 | 125 | 9.38 | Engineered wood cols. | 400 | 3.80 |
| 5 | Floor 1 | Steel deck & conc. | 16 | 671 | 1792 | Engineered wood beams | 750 | 125 | 9.38 | Engineered wood cols. | 400 | 2.67 |
| 6 | Floor 2 | Steel deck & conc. | 16 | 792 | 2115 | Engineered wood beams | 750 | 125 | 9.38 | Engineered wood cols. | 400 | 2.67 |
| 7 | Floor 3 | | | 690 | 1842 | | | | 0.00 | | | 2.67 |

## Procedures related to File C

*The function of File C is to record information and data related to each specific performance benchmark. The file contains information on Basic settings and Context, copied from the A and/or B files. The Parameters worksheet shows which parameters are active - note that the final set of active parameters is a result of settings in the A and B files, so the active set reflects both regional and specific project characteristics. The worksheets TrgA to TrgG provides Targets and scores for benchmarks that correspond to the ones established in the A file.*

*Within each Trg worksheet, the design team enters information in yellow cells relating to specific benchmarks, and the client or the design team can also suggest performance targets. A final performance assessment for each benchmark is provided either automatically by calculation, or manually by an assessor.*

*Results are shown on the Results file, which provides both relative and absolute results.*

18 Go to worksheets TrgA to TrgG to enter information about the project that relates to specific Criteria.

| B, C | |
|---|---|

*The excerpt below shows that, in some cases, data previously inserted in File B, is brought forward to the relevant Criterion in File C.*

| | | | |
|---|---|---|---|
| Design or Operating data | Embodied energy from external program, GJ/m2 * yr | N.A. | |
| | Embodied energy using SBTool approximations, GJ/m2 * yr | 0.14 | |
| | Embodied energy converted to Kg. CO2 emissions per m2 per year | 7.43 | |
| | Lifespan, years, from A file | 75 | |
| | Kg CO2 per GJ energy, from A file | 55 | |

*In other cases, the Design team is asked to provide a variety of data relevant to the Criterion, in this case TrgB4.2, below Note that some calculations are carried out automatically by SBTool.*

| | | | | |
|---|---|---|---|---|
| Sanitary fixtures and approximate predicted or actual gross and net water consumption | **Fixture characteristics and frequency of use per person** | Person use / day | L per use | |
| | Toilets | 6.0 | 6.0 | |
| | Urinals | 4.0 | 1.5 | |
| | Lavatories | 6.0 | 1.5 | |
| | Showers | 1.0 | 25.0 | |
| | Bathtubs | 0.2 | 90.0 | |
| | **Fixture characteristics and frequency of use per household** | Household use / day | L per use | |
| | Kitchen sinks | 4.0 | 20.0 | |
| | Dishwashers | 1.0 | 40.0 | |
| | Clothes washing machines | 0.3 | 40.0 | |
| | **Type of fixtures present** | Apartment | Indoor parking | 0 |
| | Toilets | ☐ | ☐ | |
| | Urinals | | ☐ | |
| | Lavatories (sinks) | ☐ | ☐ | |
| | Showers | ☐ | | |
| | Bathtubs (including with showers) | ☐ | | |
| | Kitchen sinks | ☐ | | |
| | Dishwashers | ☐ | | |
| | Clothes washing machines | ☐ | | |
| | **Potable water demand and net consumption** | Apartment | Indoor parking | 0 |
| | Number of dwelling units (from File B DetailSpec) | 148 | 0 | 0 |
| | Population (from File B DetailSpec) | 200 | 2 | 0 |
| | Individual water use, L pp / day | 88 | 51 | 0 |
| | Household water use, L pp / day | 98 | 0 | 0 |
| | Total occupant (individual + household) water use, L pp / day | **186** | **51** | 0 |
| | Total occupant (individual + household) water use, L / day | 37,136 | 102 | 0 |
| | Other building water use, L/day | 1000 | 2000 | 0 |
| | Annual water use, m3*yr. | 13,920 | 767 | 0 |
| | Annual water use, L / m2*yr. | **1,291** | **138** | 0 |
| | Recycled grey water or rainwater available, L m2 *yr. (TrgC4.1) | 280 | 40 | 0 |
| | Annual net potable water use, L / m2*yr. | **1,011** | **98** | 0 |

## Procedures related to File C, continued

*The illustration below shows a typical scoring section in a Criterion. The upper yellow cell (in this case 1.8) is the target value defined by the client or design team. The value below (2.1) is the official value as taken from contract documents by the design team. If this is a self-assessment, that value will remain, but if an external assessor is used, that value might be challenged and changed. The turquoise cell on the right shows the weighted score.*

| Total Project | **Total Project** | | | |
|---|---|---|---|---|
| | . | m | Score | Wtd. Score |
| Designer's target value | | 1.8 | 2.2 | **0.18** |
| Actual performance as per contract documents | | 2.1 | 3.4 | **0.28** |
| Negative | The height of the minimum elevation of the site above the elevation of the 100-year flood plain is : | 1.0 | | -1 |
| Acceptable practice | | 1.3 | | 0 |
| Good Practice | | 2.0 | | 3 |
| Best Practice | | 2.5 | | 5 |

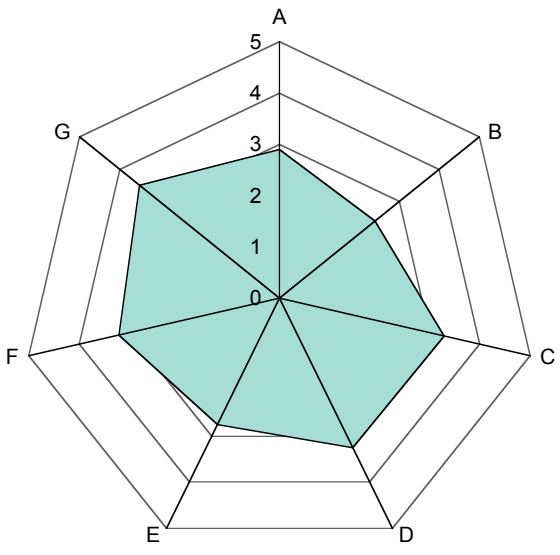
*Relative results are shown in the Results worksheet. Note that the blue click box can also show the Assessed scores.*

## Design target scores for Seoul Hirise, Seoul, Korea

| Predicted performance results based on information available during Design Phase | *Active Phase (set in Region file)* | **Design Phase** |
|---|---|---|

### Relative Performance Results

0 = Acceptable Practice; 3 = Good Practice; 5 = Best Practice




Performance Issue Areas

Design Phase scores indicate Potential Performance as predicted by an assessment of building features and plans for construction and operation that are developed during the design process.

### Project Information

This is a New construction project with a total gross area of 16323 m2. It has an estimated lifespan of 75 years, and contains the following occupancies: Apartment and Indoor parking and is located in Seoul, Korea. The assessment is valid for the Design Phase.

| | | | |
|---|---|---|---|
| Assumed life span is 75 years, and monetary units are in Won | Amortization rate for embodied energy of existing materials is set at 5 % | | |
| The project contains 148 apartment units | Design target scores | | |
| With current context and building data, the number of active low-level parameters is: | **104** | Max. potential low-level parameters: | **115** |
| The number of active low-level mandatory parameters with a score of less than 3 is: | **4** | Active low-level mandatory parameters: | **8** |

| *To see a full list of Issues, Categories and Criteria, go to the Issues worksheet.* | Active Weights | Weighted scores |
|---|---|---|
| A Site Selection, Project Planning and Development | 8% | **2.9** |
| B Energy and Resource Consumption | 23% | **2.4** |
| C Environmental Loadings | 27% | **3.3** |
| D Indoor Environmental Quality | 18% | **3.2** |
| E Service Quality | 16% | **2.7** |
| F Social and Economic aspects | 5% | **3.2** |
| G Cultural and Perceptual Aspects | 3% | **3.5** |
| Total weighted building score | | **3.0** |

## Procedures related to File C, continued

*Absolute performance results are also shown in the Results worksheet. The left data column shows results in a traditional format, e.g. kWh/m2*yr, while the right-hand column shows these values normalized for occupancy, expressed in terms of maph or million annual person hours.*

### Absolute Performance Results

| | *These data are based on the Self-Assessment values* | By area | By area & occupancy | |
|---|---|---|---|---|
| 1 | Total net consumption of primary embodied energy for structure and envelope, GJ/m2 | 10 | 6 | GJ/m$^2$*maph |
| 2 | Net annualized consumption of embodied energy for envelope and structure, MJ/m2*yr. | 135 | 76 | MJ/m$^2$*maph |
| 3 | Net annual consumption of delivered energy for building operations, MJ/m2*year | 762 | 431 | MJ/m$^2$*maph |
| 4 | Net annual consumption of primary non-renewable energy for building operations, MJ/m2*yr. | 1072 | 606 | MJ/m$^2$*maph |
| 5 | Net annual consumption of primary non-renewable energy per dwelling unit in project, MJ/m2*yr. | 7 | 4 | MJ/m$^2$*maph |
| 6 | Net annual consumption of primary non-renewable energy per dwelling unit in residential element, MJ/m2*yr. | 7 | 4 | MJ/m$^2$*maph |
| 7 | Net annualized primary embodied energy and annual operating primary energy, MJ/m2*yr. | 1207 | 682 | MJ/m$^2$*maph |
| 8 | Total on-site renewable energy used for operations, MJ/m2*yr. | 51 | 29 | MJ/m$^2$*maph |
| 9 | Net annual consumption of potable water for building operations, L / m2 * year | 1110 | 627 | m$^3$/m$^2$*maph |
| 10 | Annual use of grey water for building operations, L / m2 * year | 320 | 181 | m$^3$/m$^2$*maph |
| 11 | Net annual GHG emissions from building operations, kg. CO2 equivalent per year | 59 | 33 | kg/m$^2$*maph |
| 12 | Total present value of 25-year life-cycle cost fot total project, Won per m2. | 9,783 | | |
| 13 | Proportion of gross area of existing structure(s) re-used in the new project, percent | 0% | | |
| 14 | Proportion of gross area of project provided by re-use of existing structure(s), percent | 0% | | |