

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



|                      |                          |                |            |
|----------------------|--------------------------|----------------|------------|
| Property Reference   | Plot 2 Whitely Wood Lane | Issued on Date | 01/07/2022 |
| Assessment Reference | 001                      | Prop Type Ref  |            |
| Property             |                          |                |            |

|                                    |      |             |       |      |       |
|------------------------------------|------|-------------|-------|------|-------|
| SAP Rating                         | 89 B | DER         | 12.57 | TER  | 15.84 |
| Environmental                      | 89 B | % DER<TER   | 20.64 |      |       |
| CO <sub>2</sub> Emissions (t/year) | 1.36 | DFEE        | 50.46 | TFEE | 53.92 |
| General Requirements Compliance    | Pass | % DFEE<TFEE | 6.43  |      |       |

|                  |                                                                              |             |           |
|------------------|------------------------------------------------------------------------------|-------------|-----------|
| Assessor Details | Mr. Andrew Sadler, Build Pass Ltd, Tel: 01962 657180, andrew@buildpass.co.uk | Assessor ID | P628-0001 |
|------------------|------------------------------------------------------------------------------|-------------|-----------|

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| Client |  |
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### CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)  
CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

#### 1. Overall dwelling dimensions

|                                                        | Area (m <sup>2</sup> ) | Storey height (m)               | Volume (m <sup>3</sup> ) |
|--------------------------------------------------------|------------------------|---------------------------------|--------------------------|
| Ground floor                                           | 79.1000 (1b)           | x 2.4000 (2b)                   | = 189.8400 (1b) - (3b)   |
| First floor                                            | 66.1200 (1c)           | x 2.3500 (2c)                   | = 155.3820 (1c) - (3c)   |
| Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n) | 145.2200               |                                 | (4)                      |
| Dwelling volume                                        |                        | (3a)+(3b)+(3c)+(3d)+(3e)...(3n) | = 345.2220 (5)           |

#### 2. Ventilation rate

|                                                      | main heating                 |        | secondary heating |        | other  |        | total  | m3 per hour                 |              |        |        |              |
|------------------------------------------------------|------------------------------|--------|-------------------|--------|--------|--------|--------|-----------------------------|--------------|--------|--------|--------------|
| Number of chimneys                                   |                              | 0      | +                 | 0      | +      | 0      | =      | 0 * 40 =                    | 0.0000 (6a)  |        |        |              |
| Number of open flues                                 |                              | 0      | +                 | 0      | +      | 0      | =      | 0 * 20 =                    | 0.0000 (6b)  |        |        |              |
| Number of intermittent fans                          |                              |        |                   |        |        |        |        | 4 * 10 =                    | 40.0000 (7a) |        |        |              |
| Number of passive vents                              |                              |        |                   |        |        |        |        | 0 * 10 =                    | 0.0000 (7b)  |        |        |              |
| Number of flueless gas fires                         |                              |        |                   |        |        |        |        | 0 * 40 =                    | 0.0000 (7c)  |        |        |              |
| Air changes per hour                                 |                              |        |                   |        |        |        |        |                             |              |        |        |              |
| Infiltration due to chimneys, flues and fans         | = (6a)+(6b)+(7a)+(7b)+(7c) = |        |                   |        |        |        |        | 40.0000 / (5) =             | 0.1159 (8)   |        |        |              |
| Pressure test                                        |                              |        |                   |        |        |        |        | Yes                         |              |        |        |              |
| Measured/design AP50                                 |                              |        |                   |        |        |        |        | 5.0000                      |              |        |        |              |
| Infiltration rate                                    |                              |        |                   |        |        |        |        | 0.3659 (18)                 |              |        |        |              |
| Number of sides sheltered                            |                              |        |                   |        |        |        |        | 0 (19)                      |              |        |        |              |
| Shelter factor                                       |                              |        |                   |        |        |        |        | (20) = 1 - [0.075 x (19)] = | 1.0000 (20)  |        |        |              |
| Infiltration rate adjusted to include shelter factor |                              |        |                   |        |        |        |        | (21) = (18) x (20) =        | 0.3659 (21)  |        |        |              |
|                                                      | Jan                          | Feb    | Mar               | Apr    | May    | Jun    | Jul    | Aug                         | Sep          | Oct    | Nov    | Dec          |
| Wind speed                                           | 5.1000                       | 5.0000 | 4.9000            | 4.4000 | 4.3000 | 3.8000 | 3.8000 | 3.7000                      | 4.0000       | 4.3000 | 4.5000 | 4.7000 (22)  |
| Wind factor                                          | 1.2750                       | 1.2500 | 1.2250            | 1.1000 | 1.0750 | 0.9500 | 0.9500 | 0.9250                      | 1.0000       | 1.0750 | 1.1250 | 1.1750 (22a) |
| Adj infilt rate                                      | 0.4665                       | 0.4573 | 0.4482            | 0.4025 | 0.3933 | 0.3476 | 0.3476 | 0.3384                      | 0.3659       | 0.3933 | 0.4116 | 0.4299 (22b) |
| Effective ac                                         | 0.6088                       | 0.6046 | 0.6004            | 0.5810 | 0.5773 | 0.5604 | 0.5604 | 0.5573                      | 0.5669       | 0.5773 | 0.5847 | 0.5924 (25)  |

#### 3. Heat losses and heat loss parameter

| Element                                                             | Gross<br>m2    | Openings<br>m2 | NetArea<br>m2        | U-value<br>W/m2K | A x U<br>W/K   | K-value<br>kJ/m2K | A x K<br>kJ/K  |                |                             |                |                |                     |
|---------------------------------------------------------------------|----------------|----------------|----------------------|------------------|----------------|-------------------|----------------|----------------|-----------------------------|----------------|----------------|---------------------|
| Door                                                                |                |                | 2.1000               | 1.0000           | 2.1000         |                   |                | (26)           |                             |                |                |                     |
| Window (Uw = 1.20)                                                  |                |                | 23.7400              | 1.1450           | 27.1832        |                   |                | (27)           |                             |                |                |                     |
| Roof Light (Velux) (Uw = 1.30)                                      |                |                | 3.2800               | 1.2357           | 4.0532         |                   |                | (27a)          |                             |                |                |                     |
| Heat Loss Floor 1                                                   |                |                | 79.1000              | 0.1100           | 8.7010         |                   |                | (28a)          |                             |                |                |                     |
| External Wall 1                                                     | 148.7200       | 20.4000        | 128.3200             | 0.2400           | 30.7968        |                   |                | (29a)          |                             |                |                |                     |
| Dormer Wall                                                         | 15.3700        | 5.4400         | 9.9300               | 0.2200           | 2.1846         |                   |                | (29a)          |                             |                |                |                     |
| Pitched Roof                                                        | 30.0800        | 3.2800         | 26.8000              | 0.1400           | 3.7520         |                   |                | (30)           |                             |                |                |                     |
| Planned Roof                                                        | 50.7600        |                | 50.7600              | 0.1000           | 5.0760         |                   |                | (30)           |                             |                |                |                     |
| Total net area of external elements Aum(A, m2)                      |                |                | 324.0300             |                  |                |                   |                | (31)           |                             |                |                |                     |
| Fabric heat loss, W/K = Sum (A x U)                                 |                |                | (26)...(30) + (32) = |                  | 83.8468        |                   |                | (33)           |                             |                |                |                     |
| Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K                   |                |                |                      |                  |                |                   |                |                | 250.0000 (35)               |                |                |                     |
| Thermal bridges (Sum(L x Psi) calculated using Appendix K)          |                |                |                      |                  |                |                   |                |                | 23.6770 (36)                |                |                |                     |
| Total fabric heat loss                                              |                |                |                      |                  |                |                   |                |                | (33) + (36) = 107.5238 (37) |                |                |                     |
| Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5) |                |                |                      |                  |                |                   |                |                |                             |                |                |                     |
| (38)m                                                               | Jan<br>69.3567 | Feb<br>68.8754 | Mar<br>68.4036       | Apr<br>66.1877   | May<br>65.7731 | Jun<br>63.8430    | Jul<br>63.8430 | Aug<br>63.4856 | Sep<br>64.5865              | Oct<br>65.7731 | Nov<br>66.6118 | Dec<br>67.4887 (38) |

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### CALCULATION OF FABRIC ENERGY EFFICIENCY 09 Jan 2014

|                           |          |          |          |          |          |          |          |          |          |          |          |               |
|---------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------|
| Heat transfer coeff       | 176.8806 | 176.3993 | 175.9275 | 173.7115 | 173.2969 | 171.3669 | 171.3669 | 171.0095 | 172.1103 | 173.2969 | 174.1356 | 175.0125 (39) |
| Average = Sum(39)m / 12 = |          |          |          |          |          |          |          |          |          |          |          | 173.7095 (39) |
| HLP                       | Jan      | Feb      | Mar      | Apr      | May      | Jun      | Jul      | Aug      | Sep      | Oct      | Nov      | Dec           |
| HLP (average)             | 1.2180   | 1.2147   | 1.2115   | 1.1962   | 1.1933   | 1.1801   | 1.1801   | 1.1776   | 1.1852   | 1.1933   | 1.1991   | 1.2052 (40)   |
| Days in month             |          |          |          |          |          |          |          |          |          |          |          | 1.1962 (40)   |
|                           | 31       | 28       | 31       | 30       | 31       | 30       | 31       | 31       | 30       | 31       | 30       | 31 (41)       |

#### 4. Water heating energy requirements (kWh/year)

|                                              |          |          |          |          |          |          |          |          |          |                    |          |                |
|----------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------|----------|----------------|
| Assumed occupancy                            |          |          |          |          |          |          |          |          |          |                    |          | 2.9264 (42)    |
| Average daily hot water use (litres/day)     |          |          |          |          |          |          |          |          |          |                    |          | 103.7028 (43)  |
|                                              | Jan      | Feb      | Mar      | Apr      | May      | Jun      | Jul      | Aug      | Sep      | Oct                | Nov      | Dec            |
| Daily hot water use                          | 114.0731 | 109.9250 | 105.7768 | 101.6287 | 97.4806  | 93.3325  | 93.3325  | 97.4806  | 101.6287 | 105.7768           | 109.9250 | 114.0731 (44)  |
| Energy conte                                 | 169.1671 | 147.9546 | 152.6759 | 133.1065 | 127.7189 | 110.2117 | 102.1273 | 117.1926 | 118.5923 | 138.2079           | 150.8647 | 163.8293 (45)  |
| Energy content (annual)                      |          |          |          |          |          |          |          |          |          | Total = Sum(45)m = |          | 1631.6487 (45) |
| Distribution loss (46)m = 0.15 x (45)m       | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000             | 0.0000   | 0.0000 (46)    |
| Water storage loss:                          |          |          |          |          |          |          |          |          |          |                    |          |                |
| Total storage loss                           | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000             | 0.0000   | 0.0000 (56)    |
| If cylinder contains dedicated solar storage | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000             | 0.0000   | 0.0000 (57)    |
| Primary loss                                 | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000             | 0.0000   | 0.0000 (59)    |
| Heat gains from water heating, kWh/month     | 35.9480  | 31.4404  | 32.4436  | 28.2851  | 27.1403  | 23.4200  | 21.7021  | 24.9034  | 25.2009  | 29.3692            | 32.0587  | 34.8137 (65)   |

#### 5. Internal gains (see Table 5 and 5a)

|                                                                                     |           |           |           |           |           |           |           |           |           |           |           |                |
|-------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------|
| Metabolic gains (Table 5), Watts                                                    | Jan       | Feb       | Mar       | Apr       | May       | Jun       | Jul       | Aug       | Sep       | Oct       | Nov       | Dec            |
| (66)m                                                                               | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217 (66)  |
| Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5     | 28.4655   | 25.2828   | 20.5613   | 15.5663   | 11.6360   | 9.8236    | 10.6147   | 13.7974   | 18.5188   | 23.5139   | 27.4442   | 29.2566 (67)   |
| Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5 | 315.2730  | 318.5445  | 310.3003  | 292.7494  | 270.5946  | 249.7721  | 235.8614  | 232.5899  | 240.8341  | 258.3850  | 280.5399  | 301.3623 (68)  |
| Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5    | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322 (69)   |
| Pumps, fans                                                                         | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000 (70)    |
| Losses e.g. evaporation (negative values) (Table 5)                                 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 (71) |
| Water heating gains (Table 5)                                                       | 48.3172   | 46.7862   | 43.6070   | 39.2849   | 36.4789   | 32.5278   | 29.1694   | 33.4724   | 35.0012   | 39.4747   | 44.5260   | 46.7926 (72)   |
| Total internal gains                                                                | 458.9522  | 457.5100  | 441.3652  | 414.4971  | 385.6059  | 359.0199  | 342.5421  | 346.7561  | 361.2506  | 388.2701  | 419.4066  | 444.3081 (73)  |

#### 6. Solar gains

| [Jan]       |          |          |           | Area<br>m2 | Solar flux<br>Table 6a<br>W/m2 |           | g<br>Specific data<br>or Table 6b |           | FF<br>Specific data<br>or Table 6c |          | Access<br>factor<br>Table 6d |          | Gains<br>W    |
|-------------|----------|----------|-----------|------------|--------------------------------|-----------|-----------------------------------|-----------|------------------------------------|----------|------------------------------|----------|---------------|
| -----       |          |          |           |            |                                |           |                                   |           |                                    |          |                              |          |               |
| East        |          |          |           | 6.9800     | 19.6403                        |           | 0.6300                            |           | 0.7000                             |          | 0.7700                       |          | 41.8962 (76)  |
| South       |          |          |           | 12.6000    | 46.7521                        |           | 0.6300                            |           | 0.7000                             |          | 0.7700                       |          | 180.0293 (78) |
| West        |          |          |           | 4.1600     | 19.6403                        |           | 0.6300                            |           | 0.7000                             |          | 0.7700                       |          | 24.9697 (80)  |
| North       |          |          |           | 2.0000     | 16.1759                        |           | 0.6300                            |           | 0.7000                             |          | 1.0000                       |          | 12.8404 (82)  |
| West        |          |          |           | 1.2800     | 26.4634                        |           | 0.6300                            |           | 0.7000                             |          | 1.0000                       |          | 13.4443 (82)  |
| -----       |          |          |           |            |                                |           |                                   |           |                                    |          |                              |          |               |
| Solar gains | 273.1798 | 477.0437 | 681.7770  | 890.1090   | 1035.9593                      | 1044.9563 | 1000.6355                         | 889.7338  | 753.8219                           | 535.2705 | 329.3902                     | 232.3449 | (83)          |
| Total gains | 732.1320 | 934.5538 | 1123.1422 | 1304.6061  | 1421.5652                      | 1403.9763 | 1343.1776                         | 1236.4899 | 1115.0725                          | 923.5406 | 748.7968                     | 676.6530 | (84)          |

#### 7. Mean internal temperature (heating season)

|                                                                             |         |         |         |         |         |         |         |         |                           |         |         |              |
|-----------------------------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------------------------|---------|---------|--------------|
| Temperature during heating periods in the living area from Table 9, Th1 (C) |         |         |         |         |         |         |         |         |                           |         |         | 21.0000 (85) |
| Utilisation factor for gains for living area, nil,m (see Table 9a)          | Jan     | Feb     | Mar     | Apr     | May     | Jun     | Jul     | Aug     | Sep                       | Oct     | Nov     | Dec          |
| tau                                                                         | 57.0143 | 57.1699 | 57.3232 | 58.0544 | 58.1933 | 58.8487 | 58.8487 | 58.9717 | 58.5945                   | 58.1933 | 57.9130 | 57.6229      |
| alpha                                                                       | 4.8010  | 4.8113  | 4.8215  | 4.8703  | 4.8796  | 4.9232  | 4.9232  | 4.9314  | 4.9063                    | 4.8796  | 4.8609  | 4.8415       |
| util living area                                                            | 0.9991  | 0.9968  | 0.9892  | 0.9604  | 0.8775  | 0.7152  | 0.5465  | 0.6095  | 0.8557                    | 0.9810  | 0.9977  | 0.9994 (86)  |
| MIT                                                                         | 19.5803 | 19.7801 | 20.0791 | 20.4556 | 20.7663 | 20.9404 | 20.9872 | 20.9788 | 20.8500                   | 20.4249 | 19.9274 | 19.5504 (87) |
| Th 2                                                                        | 19.9056 | 19.9083 | 19.9108 | 19.9230 | 19.9253 | 19.9360 | 19.9360 | 19.9380 | 19.9319                   | 19.9253 | 19.9207 | 19.9159 (88) |
| util rest of house                                                          | 0.9987  | 0.9957  | 0.9852  | 0.9451  | 0.8310  | 0.6214  | 0.4219  | 0.4818  | 0.7842                    | 0.9710  | 0.9967  | 0.9992 (89)  |
| MIT 2                                                                       | 18.6094 | 18.8108 | 19.1096 | 19.4857 | 19.7687 | 19.9090 | 19.9328 | 19.9320 | 19.8488                   | 19.4638 | 18.9681 | 18.5877 (90) |
| Living area fraction                                                        |         |         |         |         |         |         |         |         | fLA = Living area / (4) = |         |         | 0.5447 (91)  |
| MIT                                                                         | 19.1382 | 19.3388 | 19.6377 | 20.0140 | 20.3121 | 20.4708 | 20.5071 | 20.5022 | 20.3942                   | 19.9873 | 19.4906 | 19.1121 (92) |
| Temperature adjustment                                                      |         |         |         |         |         |         |         |         |                           |         |         | 0.0000       |
| adjusted MIT                                                                | 19.1382 | 19.3388 | 19.6377 | 20.0140 | 20.3121 | 20.4708 | 20.5071 | 20.5022 | 20.3942                   | 19.9873 | 19.4906 | 19.1121 (93) |

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#### 8. Space heating requirement

|                      | Jan       | Feb       | Mar       | Apr       | May       | Jun       | Jul      | Aug      | Sep       | Oct       | Nov          | Dec       |       |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|-----------|--------------|-----------|-------|
| Utilisation          | 0.9984    | 0.9949    | 0.9839    | 0.9466    | 0.8495    | 0.6709    | 0.4902   | 0.5518   | 0.8185    | 0.9717    | 0.9962       | 0.9989    | (94)  |
| Useful gains         | 730.9817  | 929.7853  | 1105.0767 | 1234.9120 | 1207.5592 | 941.8797  | 658.4697 | 682.2966 | 912.6404  | 897.3993  | 745.9393     | 675.9254  | (95)  |
| Ext temp.            | 4.3000    | 4.9000    | 6.5000    | 8.9000    | 11.7000   | 14.6000   | 16.6000  | 16.4000  | 14.1000   | 10.6000   | 7.1000       | 4.2000    | (96)  |
| Heat loss rate W     |           |           |           |           |           |           |          |          |           |           |              |           |       |
|                      | 2624.5966 | 2546.9940 | 2311.2745 | 1930.6270 | 1492.4491 | 1006.0658 | 669.5516 | 701.5095 | 1083.2933 | 1626.7859 | 2157.6443    | 2609.7985 | (97)  |
| Month fracti         | 1.0000    | 1.0000    | 1.0000    | 1.0000    | 1.0000    | 0.0000    | 0.0000   | 0.0000   | 0.0000    | 1.0000    | 1.0000       | 1.0000    | (97a) |
| Space heating kWh    |           |           |           |           |           |           |          |          |           |           |              |           |       |
|                      | 1408.8495 | 1086.7642 | 897.4111  | 500.9148  | 211.9581  | 0.0000    | 0.0000   | 0.0000   | 0.0000    | 542.6636  | 1016.4276    | 1438.8016 | (98)  |
| Space heating        |           |           |           |           |           |           |          |          |           |           |              |           | (98)  |
| Space heating per m2 |           |           |           |           |           |           |          |          |           |           |              | 7103.7906 | (98)  |
|                      |           |           |           |           |           |           |          |          |           |           | (98) / (4) = | 48.9174   | (99)  |

#### 8c. Space cooling requirement

Calculated for June, July and August. See Table 10b

|                                          | Jan    | Feb    | Mar    | Apr    | May     | Jun       | Jul       | Aug       | Sep     | Oct     | Nov    | Dec      |        |
|------------------------------------------|--------|--------|--------|--------|---------|-----------|-----------|-----------|---------|---------|--------|----------|--------|
| Ext. temp.                               | 4.3000 | 4.9000 | 6.5000 | 8.9000 | 11.7000 | 14.6000   | 16.6000   | 16.4000   | 14.1000 | 10.6000 | 7.1000 | 4.2000   |        |
| Heat loss rate W                         |        |        |        |        |         |           |           |           |         |         |        |          |        |
| 0.0000                                   | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 1610.8486 | 1268.1149 | 1299.6719 | 0.0000  | 0.0000  | 0.0000 | 0.0000   | (100)  |
| Utilisation                              | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 0.8588    | 0.9207    | 0.8938    | 0.0000  | 0.0000  | 0.0000 | 0.0000   | (101)  |
| Useful loss                              | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 1383.3918 | 1167.5835 | 1161.6007 | 0.0000  | 0.0000  | 0.0000 | 0.0000   | (102)  |
| Total gains                              | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 1727.2643 | 1655.9608 | 1541.4755 | 0.0000  | 0.0000  | 0.0000 | 0.0000   | (103)  |
| Month fracti                             | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 1.0000    | 1.0000    | 1.0000    | 0.0000  | 0.0000  | 0.0000 | 0.0000   | (103a) |
| Space cooling kWh                        |        |        |        |        |         |           |           |           |         |         |        |          |        |
| 0.0000                                   | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 247.5881  | 363.3527  | 282.6268  | 0.0000  | 0.0000  | 0.0000 | 0.0000   | (104)  |
| Space cooling                            |        |        |        |        |         |           |           |           |         |         |        | 893.5676 | (104)  |
| Cooled fraction                          |        |        |        |        |         |           |           |           |         |         |        | 1.0000   | (105)  |
| Intermittency factor (Table 10b)         |        |        |        |        |         |           |           |           |         |         |        |          |        |
| 0.0000                                   | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 0.2500    | 0.2500    | 0.2500    | 0.0000  | 0.0000  | 0.0000 | 0.0000   | (106)  |
| Space cooling kWh                        |        |        |        |        |         |           |           |           |         |         |        |          |        |
| 0.0000                                   | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 61.8970   | 90.8382   | 70.6567   | 0.0000  | 0.0000  | 0.0000 | 0.0000   | (107)  |
| Space cooling                            |        |        |        |        |         |           |           |           |         |         |        | 223.3919 | (107)  |
| Space cooling per m2                     |        |        |        |        |         |           |           |           |         |         |        | 1.5383   | (108)  |
| Energy for space heating                 |        |        |        |        |         |           |           |           |         |         |        | 48.9174  | (99)   |
| Energy for space cooling                 |        |        |        |        |         |           |           |           |         |         |        | 1.5383   | (108)  |
| Total                                    |        |        |        |        |         |           |           |           |         |         |        | 50.4557  | (109)  |
| Dwelling Fabric Energy Efficiency (DFEE) |        |        |        |        |         |           |           |           |         |         |        | 50.5     | (109)  |

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)  
CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

#### 1. Overall dwelling dimensions

|                                                        | Area<br>(m <sup>2</sup> ) | Storey height<br>(m)            | Volume<br>(m <sup>3</sup> ) |
|--------------------------------------------------------|---------------------------|---------------------------------|-----------------------------|
| Ground floor                                           | 79.1000 (1b)              | x 2.4000 (2b)                   | = 189.8400 (1b) - (3b)      |
| First floor                                            | 66.1200 (1c)              | x 2.3500 (2c)                   | = 155.3820 (1c) - (3c)      |
| Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n) | 145.2200                  |                                 | (4)                         |
| Dwelling volume                                        |                           | (3a)+(3b)+(3c)+(3d)+(3e)...(3n) | = 345.2220 (5)              |

#### 2. Ventilation rate

|                                                                           | main<br>heating | secondary<br>heating | other | total                       | m <sup>3</sup> per hour    |
|---------------------------------------------------------------------------|-----------------|----------------------|-------|-----------------------------|----------------------------|
| Number of chimneys                                                        | 0               | +                    | 0     | =                           | 0 * 40 = 0.0000 (6a)       |
| Number of open flues                                                      | 0               | +                    | 0     | =                           | 0 * 20 = 0.0000 (6b)       |
| Number of intermittent fans                                               |                 |                      |       |                             | 4 * 10 = 40.0000 (7a)      |
| Number of passive vents                                                   |                 |                      |       |                             | 0 * 10 = 0.0000 (7b)       |
| Number of flueless gas fires                                              |                 |                      |       |                             | 0 * 40 = 0.0000 (7c)       |
| Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) = |                 |                      |       |                             | 40.0000 / (5) = 0.1159 (8) |
| Pressure test                                                             |                 |                      |       |                             | Yes                        |
| Measured/design AP50                                                      |                 |                      |       |                             | 5.0000                     |
| Infiltration rate                                                         |                 |                      |       |                             | 0.3659 (18)                |
| Number of sides sheltered                                                 |                 |                      |       |                             | 0 (19)                     |
| Shelter factor                                                            |                 |                      |       | (20) = 1 - [0.075 x (19)] = | 1.0000 (20)                |
| Infiltration rate adjusted to include shelter factor                      |                 |                      |       | (21) = (18) x (20) =        | 0.3659 (21)                |

  

|                 | Jan    | Feb    | Mar    | Apr    | May    | Jun    | Jul    | Aug    | Sep    | Oct    | Nov    | Dec          |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------|
| Wind speed      | 5.1000 | 5.0000 | 4.9000 | 4.4000 | 4.3000 | 3.8000 | 3.8000 | 3.7000 | 4.0000 | 4.3000 | 4.5000 | 4.7000 (22)  |
| Wind factor     | 1.2750 | 1.2500 | 1.2250 | 1.1000 | 1.0750 | 0.9500 | 0.9500 | 0.9250 | 1.0000 | 1.0750 | 1.1250 | 1.1750 (22a) |
| Adj infilt rate | 0.4665 | 0.4573 | 0.4482 | 0.4025 | 0.3933 | 0.3476 | 0.3476 | 0.3384 | 0.3659 | 0.3933 | 0.4116 | 0.4299 (22b) |
| Effective ac    | 0.6088 | 0.6046 | 0.6004 | 0.5810 | 0.5773 | 0.5604 | 0.5604 | 0.5573 | 0.5669 | 0.5773 | 0.5847 | 0.5924 (25)  |

#### 3. Heat losses and heat loss parameter

| Element                                                        | Gross<br>m <sup>2</sup> | Openings<br>m <sup>2</sup> | NetArea<br>m <sup>2</sup> | U-value<br>W/m <sup>2</sup> K | A x U<br>W/K         | K-value<br>kJ/m <sup>2</sup> K | A x K<br>kJ/K |
|----------------------------------------------------------------|-------------------------|----------------------------|---------------------------|-------------------------------|----------------------|--------------------------------|---------------|
| TER Opaque door                                                |                         |                            | 2.1000                    | 1.0000                        | 2.1000               |                                | (26)          |
| TER Opening Type (Uw = 1.40)                                   |                         |                            | 23.7400                   | 1.3258                        | 31.4735              |                                | (27)          |
| TER Room Window (Uw = 1.70)                                    |                         |                            | 3.2800                    | 1.5918                        | 5.2210               |                                | (27a)         |
| Heat Loss Floor 1                                              |                         |                            | 79.1000                   | 0.1300                        | 10.2830              |                                | (28a)         |
| External Wall 1                                                | 148.7200                | 20.4000                    | 128.3200                  | 0.1800                        | 23.0976              |                                | (29a)         |
| Dormer Wall                                                    |                         | 5.4400                     | 9.9300                    | 0.1800                        | 1.7874               |                                | (29a)         |
| Pitched Roof                                                   | 30.0800                 | 3.2800                     | 26.8000                   | 0.1300                        | 3.4840               |                                | (30)          |
| Planned Roof                                                   | 50.7600                 |                            | 50.7600                   | 0.1300                        | 6.5988               |                                | (30)          |
| Total net area of external elements Aum(A, m <sup>2</sup> )    |                         |                            | 324.0300                  |                               |                      |                                | (31)          |
| Fabric heat loss, W/K = Sum (A x U)                            |                         |                            |                           |                               | (26)...(30) + (32) = | 84.0453                        | (33)          |
| Thermal mass parameter (TMP = Cm / TFA) in kJ/m <sup>2</sup> K |                         |                            |                           |                               |                      |                                | 250.0000 (35) |
| Thermal bridges (Sum(L x Psi) calculated using Appendix K)     |                         |                            |                           |                               |                      |                                | 14.6240 (36)  |
| Total fabric heat loss                                         |                         |                            |                           |                               |                      | (33) + (36) =                  | 98.6693 (37)  |

  

|                                                                     |          |          |          |          |          |          |          |          |          |          |          |               |
|---------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------------|
| Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5) |          |          |          |          |          |          |          |          |          |          |          |               |
| (38)m                                                               | Jan      | Feb      | Mar      | Apr      | May      | Jun      | Jul      | Aug      | Sep      | Oct      | Nov      | Dec           |
| Heat transfer coeff                                                 | 69.3567  | 68.8754  | 68.4036  | 66.1877  | 65.7731  | 63.8430  | 63.8430  | 63.4856  | 64.5865  | 65.7731  | 66.6118  | 67.4887 (38)  |
| Average = Sum(39)m / 12 =                                           | 168.0260 | 167.5447 | 167.0729 | 164.8569 | 164.4423 | 162.5123 | 162.5123 | 162.1549 | 163.2557 | 164.4423 | 165.2811 | 166.1579 (39) |
|                                                                     |          |          |          |          |          |          |          |          |          |          |          | 164.8549 (39) |

  

|               |        |        |        |        |        |        |        |        |        |        |        |             |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------|
| HLP           | Jan    | Feb    | Mar    | Apr    | May    | Jun    | Jul    | Aug    | Sep    | Oct    | Nov    | Dec         |
| HLP (average) | 1.1570 | 1.1537 | 1.1505 | 1.1352 | 1.1324 | 1.1191 | 1.1191 | 1.1166 | 1.1242 | 1.1324 | 1.1381 | 1.1442 (40) |
| Days in month |        |        |        |        |        |        |        |        |        |        |        | 1.1352 (40) |
|               | 31     | 28     | 31     | 30     | 31     | 30     | 31     | 31     | 30     | 31     | 30     | 31 (41)     |

#### 4. Water heating energy requirements (kWh/year)

|                                          |  |  |  |  |  |  |  |  |  |  |  |               |
|------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|---------------|
| Assumed occupancy                        |  |  |  |  |  |  |  |  |  |  |  | 2.9264 (42)   |
| Average daily hot water use (litres/day) |  |  |  |  |  |  |  |  |  |  |  | 103.7028 (43) |

  

|                                        | Jan      | Feb      | Mar      | Apr      | May      | Jun      | Jul      | Aug      | Sep      | Oct      | Nov      | Dec                               |
|----------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------------------------------|
| Daily hot water use                    | 114.0731 | 109.9250 | 105.7768 | 101.6287 | 97.4806  | 93.3325  | 93.3325  | 97.4806  | 101.6287 | 105.7768 | 109.9250 | 114.0731 (44)                     |
| Energy conte                           | 169.1671 | 147.9546 | 152.6759 | 133.1065 | 127.7189 | 110.2117 | 102.1273 | 117.1926 | 118.5923 | 138.2079 | 150.8647 | 163.8293 (45)                     |
| Energy content (annual)                |          |          |          |          |          |          |          |          |          |          |          | Total = Sum(45)m = 1631.6487 (45) |
| Distribution loss (46)m = 0.15 x (45)m |          |          |          |          |          |          |          |          |          |          |          |                                   |
|                                        | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000   | 0.0000 (46)                       |
| Water storage loss:                    |          |          |          |          |          |          |          |          |          |          |          |                                   |

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

|                                              |         |         |         |         |         |         |         |         |         |         |         |              |
|----------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------|
| Total storage loss                           | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000 (56)  |
| If cylinder contains dedicated solar storage | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000 (57)  |
| Primary loss                                 | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000  | 0.0000 (59)  |
| Heat gains from water heating, kWh/month     | 35.9480 | 31.4404 | 32.4436 | 28.2851 | 27.1403 | 23.4200 | 21.7021 | 24.9034 | 25.2009 | 29.3692 | 32.0587 | 34.8137 (65) |

#### 5. Internal gains (see Table 5 and 5a)

|                                                                                     |           |           |           |           |           |           |           |           |           |           |           |           |      |
|-------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------|
| Metabolic gains (Table 5), Watts                                                    | Jan       | Feb       | Mar       | Apr       | May       | Jun       | Jul       | Aug       | Sep       | Oct       | Nov       | Dec       |      |
| (66)m                                                                               | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | 146.3217  | (66) |
| Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5     | 28.4655   | 25.2828   | 20.5613   | 15.5663   | 11.6360   | 9.8236    | 10.6147   | 13.7974   | 18.5188   | 23.5139   | 27.4442   | 29.2566   | (67) |
| Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5 | 315.2730  | 318.5445  | 310.3003  | 292.7494  | 270.5946  | 249.7721  | 235.8614  | 232.5899  | 240.8341  | 258.3850  | 280.5399  | 301.3623  | (68) |
| Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5    | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | 37.6322   | (69) |
| Pumps, fans                                                                         | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | 0.0000    | (70) |
| Losses e.g. evaporation (negative values) (Table 5)                                 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | -117.0573 | (71) |
| Water heating gains (Table 5)                                                       | 48.3172   | 46.7862   | 43.6070   | 39.2849   | 36.4789   | 32.5278   | 29.1694   | 33.4724   | 35.0012   | 39.4747   | 44.5260   | 46.7926   | (72) |
| Total internal gains                                                                | 458.9522  | 457.5100  | 441.3652  | 414.4971  | 385.6059  | 359.0199  | 342.5421  | 346.7561  | 361.2506  | 388.2701  | 419.4066  | 444.3081  | (73) |

#### 6. Solar gains

| [Jan] | Area<br>m2 | Solar flux<br>Table 6a<br>W/m2 | g<br>Specific data<br>or Table 6b | FF<br>Specific data<br>or Table 6c | Access<br>factor<br>Table 6d | Gains<br>W    |
|-------|------------|--------------------------------|-----------------------------------|------------------------------------|------------------------------|---------------|
| East  | 6.9800     | 19.6403                        | 0.6300                            | 0.7000                             | 0.7700                       | 41.8962 (76)  |
| South | 12.6000    | 46.7521                        | 0.6300                            | 0.7000                             | 0.7700                       | 180.0293 (78) |
| West  | 4.1600     | 19.6403                        | 0.6300                            | 0.7000                             | 0.7700                       | 24.9697 (80)  |
| North | 2.0000     | 16.1759                        | 0.6300                            | 0.7000                             | 1.0000                       | 12.8404 (82)  |
| West  | 1.2800     | 26.4634                        | 0.6300                            | 0.7000                             | 1.0000                       | 13.4443 (82)  |

|             |          |          |           |           |           |           |           |           |           |          |          |          |      |
|-------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|------|
| Solar gains | 273.1798 | 477.0437 | 681.7770  | 890.1090  | 1035.9593 | 1044.9563 | 1000.6355 | 889.7338  | 753.8219  | 535.2705 | 329.3902 | 232.3449 | (83) |
| Total gains | 732.1320 | 934.5538 | 1123.1422 | 1304.6061 | 1421.5652 | 1403.9763 | 1343.1776 | 1236.4899 | 1115.0725 | 923.5406 | 748.7968 | 676.6530 | (84) |

#### 7. Mean internal temperature (heating season)

|                                                                             |         |         |         |         |         |         |         |         |                           |         |         |         |              |
|-----------------------------------------------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------------------------|---------|---------|---------|--------------|
| Temperature during heating periods in the living area from Table 9, Thl (C) |         |         |         |         |         |         |         |         |                           |         |         |         | 21.0000 (85) |
| Utilisation factor for gains for living area, nil,m (see Table 9a)          | Jan     | Feb     | Mar     | Apr     | May     | Jun     | Jul     | Aug     | Sep                       | Oct     | Nov     | Dec     |              |
| tau                                                                         | 60.0188 | 60.1912 | 60.3612 | 61.1726 | 61.3268 | 62.0551 | 62.0551 | 62.1919 | 61.7726                   | 61.3268 | 61.0156 | 60.6936 |              |
| alpha                                                                       | 5.0013  | 5.0127  | 5.0241  | 5.0782  | 5.0885  | 5.1370  | 5.1370  | 5.1461  | 5.1182                    | 5.0885  | 5.0677  | 5.0462  |              |
| util living area                                                            | 0.9991  | 0.9968  | 0.9886  | 0.9567  | 0.8647  | 0.6919  | 0.5224  | 0.5847  | 0.8408                    | 0.9795  | 0.9977  | 0.9994  | (86)         |
| MIT                                                                         | 19.6601 | 19.8587 | 20.1515 | 20.5158 | 20.8053 | 20.9554 | 20.9913 | 20.9850 | 20.8772                   | 20.4773 | 19.9952 | 19.6306 | (87)         |
| Th 2                                                                        | 19.9545 | 19.9572 | 19.9598 | 19.9722 | 19.9745 | 19.9853 | 19.9853 | 19.9873 | 19.9811                   | 19.9745 | 19.9698 | 19.9649 | (88)         |
| util rest of house                                                          | 0.9988  | 0.9957  | 0.9845  | 0.9404  | 0.8169  | 0.6014  | 0.4071  | 0.4652  | 0.7683                    | 0.9691  | 0.9967  | 0.9992  | (89)         |
| MIT 2                                                                       | 18.7279 | 18.9282 | 19.2206 | 19.5841 | 19.8451 | 19.9653 | 19.9831 | 19.9831 | 19.9139                   | 19.5550 | 19.0749 | 18.7068 | (90)         |
| Living area fraction                                                        |         |         |         |         |         |         |         |         | fLA = Living area / (4) = |         |         | 0.5447  | (91)         |
| MIT                                                                         | 19.2356 | 19.4350 | 19.7276 | 20.0916 | 20.3681 | 20.5046 | 20.5323 | 20.5289 | 20.4386                   | 20.0574 | 19.5762 | 19.2100 | (92)         |
| Temperature adjustment                                                      |         |         |         |         |         |         |         |         |                           |         |         | 0.0000  |              |
| adjusted MIT                                                                | 19.2356 | 19.4350 | 19.7276 | 20.0916 | 20.3681 | 20.5046 | 20.5323 | 20.5289 | 20.4386                   | 20.0574 | 19.5762 | 19.2100 | (93)         |

#### 8. Space heating requirement

|                      |           |           |           |           |           |          |          |          |           |              |           |           |       |
|----------------------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|-----------|--------------|-----------|-----------|-------|
| Utilisation          | Jan       | Feb       | Mar       | Apr       | May       | Jun      | Jul      | Aug      | Sep       | Oct          | Nov       | Dec       |       |
| Useful gains         | 0.9985    | 0.9949    | 0.9833    | 0.9426    | 0.8369    | 0.6496   | 0.4702   | 0.5306   | 0.8038    | 0.9701       | 0.9962    | 0.9990    | (94)  |
| Ext temp.            | 731.0372  | 929.8036  | 1104.4013 | 1229.7603 | 1189.6807 | 911.9644 | 631.5864 | 656.1426 | 896.2827  | 895.9304     | 745.9794  | 675.9703  | (95)  |
| Heat loss rate W     | 4.3000    | 4.9000    | 6.5000    | 8.9000    | 11.7000   | 14.6000  | 16.6000  | 16.4000  | 14.1000   | 10.6000      | 7.1000    | 4.2000    | (96)  |
| Month fracti         | 2509.5771 | 2435.2662 | 2209.9806 | 1845.0125 | 1425.4087 | 959.5658 | 639.0407 | 669.5137 | 1034.8154 | 1555.1938    | 2062.0763 | 2494.0280 | (97)  |
| Space heating kWh    | 1.0000    | 1.0000    | 1.0000    | 1.0000    | 1.0000    | 0.0000   | 0.0000   | 0.0000   | 0.0000    | 1.0000       | 1.0000    | 1.0000    | (97a) |
| Space heating        | 1323.2337 | 1011.6709 | 822.5510  | 442.9816  | 175.3816  | 0.0000   | 0.0000   | 0.0000   | 0.0000    | 490.4919     | 947.5898  | 1352.6349 | (98)  |
| Space heating per m2 |           |           |           |           |           |          |          |          |           |              |           | 6566.5354 | (98)  |
|                      |           |           |           |           |           |          |          |          |           | (98) / (4) = |           | 45.2178   | (99)  |

#### 8c. Space cooling requirement

|                                                     |        |        |        |        |         |           |           |           |         |         |        |        |       |
|-----------------------------------------------------|--------|--------|--------|--------|---------|-----------|-----------|-----------|---------|---------|--------|--------|-------|
| Calculated for June, July and August. See Table 10b | Jan    | Feb    | Mar    | Apr    | May     | Jun       | Jul       | Aug       | Sep     | Oct     | Nov    | Dec    |       |
| Ext. temp.                                          | 4.3000 | 4.9000 | 6.5000 | 8.9000 | 11.7000 | 14.6000   | 16.6000   | 16.4000   | 14.1000 | 10.6000 | 7.1000 | 4.2000 |       |
| Heat loss rate W                                    | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 1527.6156 | 1202.5910 | 1232.3771 | 0.0000  | 0.0000  | 0.0000 | 0.0000 | (100) |
| Utilisation                                         | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 0.8838    | 0.9384    | 0.9152    | 0.0000  | 0.0000  | 0.0000 | 0.0000 | (101) |
| Useful loss                                         | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000  | 1350.1640 | 1128.5402 | 1127.8443 | 0.0000  | 0.0000  | 0.0000 | 0.0000 | (102) |

# FULL SAP CALCULATION PRINTOUT

## Calculation Type: New Build (As Designed)



### CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY 09 Jan 2014

|                                        |        |        |        |        |        |           |           |           |                          |        |        |                |
|----------------------------------------|--------|--------|--------|--------|--------|-----------|-----------|-----------|--------------------------|--------|--------|----------------|
| Total gains                            | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1727.2643 | 1655.9608 | 1541.4755 | 0.0000                   | 0.0000 | 0.0000 | 0.0000 (103)   |
| Month fracti                           | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000    | 1.0000    | 1.0000    | 0.0000                   | 0.0000 | 0.0000 | 0.0000 (103a)  |
| Space cooling kWh                      | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 271.5122  | 392.4009  | 307.7416  | 0.0000                   | 0.0000 | 0.0000 | 0.0000 (104)   |
| Space cooling                          |        |        |        |        |        |           |           |           |                          |        |        | 971.6547 (104) |
| Cooled fraction                        |        |        |        |        |        |           |           |           | fC = cooled area / (4) = |        |        | 1.0000 (105)   |
| Intermittency factor (Table 10b)       |        |        |        |        |        |           |           |           |                          |        |        |                |
| 0.0000                                 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.2500    | 0.2500    | 0.2500    | 0.0000                   | 0.0000 | 0.0000 | 0.0000 (106)   |
| Space cooling kWh                      | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 67.8780   | 98.1002   | 76.9354   | 0.0000                   | 0.0000 | 0.0000 | 0.0000 (107)   |
| Space cooling                          |        |        |        |        |        |           |           |           |                          |        |        | 242.9137 (107) |
| Space cooling per m2                   |        |        |        |        |        |           |           |           |                          |        |        | 1.6727 (108)   |
| Energy for space heating               |        |        |        |        |        |           |           |           |                          |        |        | 45.2178 (99)   |
| Energy for space cooling               |        |        |        |        |        |           |           |           |                          |        |        | 1.6727 (108)   |
| Total                                  |        |        |        |        |        |           |           |           |                          |        |        | 46.8906 (109)  |
| Target Fabric Energy Efficiency (TFEE) |        |        |        |        |        |           |           |           |                          |        |        | 53.9 (109)     |