

SITE NAME: RUSSEL GARDENS PH. 4

BUILDER: GREENPARK HOMES

TYPE: GRANDVILLE 2

GFA: 4178

DATE: Aug-21

LO# 80144

WINTER NATURAL AIR CHANGE RATE 0.365

HEAT LOSS AT °F. 71

CSA-F280-12

| GREENPARK HOMES                |  |           |       | TYPE: GRANDVILLE 2 |      | GFA: 4178 |     | LO# 90144 |     | SUMMER NATURAL AIR CHANGE RATE 0.130 |      |           |     | HEAT GAIN AT °F. 13 |     | CSA-P200-12 |     |           |     |           |    |                  |     |
|--------------------------------|--|-----------|-------|--------------------|------|-----------|-----|-----------|-----|--------------------------------------|------|-----------|-----|---------------------|-----|-------------|-----|-----------|-----|-----------|----|------------------|-----|
| ROOM USE                       |  | MGR       |       | ENS                |      | BED-2     |     | BED-3     |     | BED-4                                |      | ENS-2     |     | FLEX                |     | ENS-3       |     | ENS-4     |     | DIN       |    | SB-12 PACKAGE A1 |     |
| EXP. WALL                      |  | 40        |       | 27                 |      | 37        |     | 28        |     | 13                                   |      | 6         |     | 14                  |     | 6           |     | 8         |     | 27        |    | 34               |     |
| CLG. HT.                       |  | 9         |       | 9                  |      | 9         |     | 9         |     | 9                                    |      | 9         |     | 9                   |     | 9           |     | 9         |     | 10        |    | 11               |     |
| FACTORS                        |  |           |       |                    |      |           |     |           |     |                                      |      |           |     |                     |     |             |     |           |     |           |    |                  |     |
| GRS.WALL AREA                  |  | 360       |       | 243                |      | 333       |     | 252       |     | 117                                  |      | 54        |     | 128                 |     | 54          |     | 81        |     | 270       |    | 374              |     |
| GLAZING                        |  | LOSS GAIN |       | LOSS GAIN          |      | LOSS GAIN |     | LOSS GAIN |     | LOSS GAIN                            |      | LOSS GAIN |     | LOSS GAIN           |     | LOSS GAIN   |     | LOSS GAIN |     | LOSS GAIN |    | LOSS GAIN        |     |
| NORTH                          |  | 19.8      | 15.6  | 0                  | 0    | 0         | 0   | 0         | 0   | 0                                    | 0    | 7         | 138 | 109                 | 16  | 316         | 260 | 0         | 0   | 0         | 22 | 435              | 344 |
| EAST                           |  | 19.8      | 40.5  | 0                  | 0    | 0         | 0   | 0         | 0   | 0                                    | 0    | 0         | 0   | 0                   | 0   | 0           | 0   | 0         | 0   | 0         | 0  | 0                |     |
| SOUTH                          |  | 19.8      | 24.3  | 0                  | 0    | 0         | 0   | 0         | 0   | 0                                    | 0    | 0         | 0   | 0                   | 0   | 0           | 0   | 0         | 0   | 0         | 0  | 0                |     |
| WEST                           |  | 19.8      | 40.5  | 32                 | 633  | 1295      | 23  | 455       | 531 | 0                                    | 0    | 0         | 0   | 0                   | 0   | 0           | 0   | 0         | 0   | 0         | 0  | 0                |     |
| SKYLT.                         |  | 34.6      | 101.5 | 0                  | 0    | 0         | 0   | 0         | 0   | 0                                    | 0    | 0         | 0   | 0                   | 0   | 0           | 0   | 0         | 0   | 0         | 0  | 0                |     |
| DOORS                          |  | 23.5      | 4.3   | 0                  | 0    | 0         | 0   | 0         | 0   | 0                                    | 0    | 0         | 0   | 0                   | 0   | 0           | 0   | 0         | 0   | 0         | 0  | 0                |     |
| NET EXPOSED WALL               |  | 4.1       | 0.8   | 328                | 1360 | 247       | 220 | 912       | 165 | 255                                  | 1057 | 192       | 222 | 920                 | 167 | 101         | 419 | 76        | 47  | 195       | 35 | 74               | 307 |
| NET EXPOSED BSMT WALL ABOVE GR |  | 3.3       | 0.6   | 0                  | 0    | 0         | 0   | 0         | 0   | 0                                    | 0    | 0         | 0   | 0                   | 0   | 0           | 0   | 0         | 0   | 0         | 0  | 0                |     |
| EXPOSED CLG                    |  | 1.2       | 0.6   | 478                | 570  | 281       | 182 | 217       | 107 | 206                                  | 246  | 121       | 235 | 280                 | 138 | 247         | 294 | 145       | 116 | 138       | 68 | 234              | 279 |
| NO ATTIC EXPOSED CLG           |  | 2.6       | 1.3   | 0                  | 0    | 0         | 0   | 0         | 0   | 25                                   | 64   | 31        | 0   | 0                   | 0   | 0           | 0   | 0         | 0   | 0         | 0  | 0                |     |
| EXPOSED FLOOR                  |  | 2.4       | 0.4   | 0                  | 0    | 0         | 0   | 0         | 0   | 231                                  | 547  | 99        | 0   | 0                   | 0   | 0           | 0   | 0         | 85  | 201       | 37 | 0                |     |
| BASEMENT/CRAWL HEAT LOSS       |  | 0         |       | 0                  |      | 0         |     | 0         |     | 0                                    |      | 0         |     | 0                   |     | 0           |     | 0         |     | 0         |    | 0                |     |
| SLAB ON GRADE HEAT LOSS        |  | 0         |       | 0                  |      | 0         |     | 0         |     | 0                                    |      | 0         |     | 0                   |     | 0           |     | 0         |     | 0         |    | 0                |     |
| SUBTOTAL HT LOSS               |  | 2562      |       | 1884               |      | 3456      |     | 1794      |     | 1029                                 |      | 673       |     | 1051                |     | 413         |     | 531       |     | 1463      |    | 3944             |     |
| SUB TOTAL HT GAIN              |  | 1822      |       | 1203               |      | 3600      |     | 1260      |     | 610                                  |      | 249       |     | 470                 |     | 245         |     | 258       |     | 530       |    | 3194             |     |
| LEVEL FACTOR / MULTIPLIER      |  | 0.20 0.38 |       | 0.20 0.38          |      | 0.20 0.38 |     | 0.20 0.38 |     | 0.20 0.38                            |      | 0.20 0.38 |     | 0.20 0.38           |     | 0.20 0.38   |     | 0.20 0.38 |     | 0.30 0.55 |    | 0.30 0.55        |     |
| AIR CHANGE HEAT LOSS           |  | 978       |       | 604                |      | 1319      |     | 984       |     | 393                                  |      | 257       |     | 401                 |     | 155         |     | 203       |     | 801       |    | 1667             |     |
| AIR CHANGE HEAT GAIN           |  | 148       |       | 98                 |      | 292       |     | 102       |     | 50                                   |      | 20        |     | 38                  |     | 20          |     | 22        |     | 43        |    | 269              |     |
| DUCT LOSS                      |  | 0         |       | 0                  |      | 477       |     | 0         |     | 0                                    |      | 93        |     | 0                   |     | 0           |     | 0         |     | 0         |    | 0                |     |
| DUCT GAIN                      |  | 0         |       | 0                  |      | 479       |     | 0         |     | 0                                    |      | 27        |     | 0                   |     | 0           |     | 0         |     | 0         |    | 0                |     |
| HEAT GAIN PEOPLE               |  | 240       |       | 2                  |      | 480       |     | 1         |     | 240                                  |      | 1         |     | 240                 |     | 0           |     | 0         |     | 0         |    | 0                |     |
| HEAT GAIN APPLIANCES/LIGHTS    |  | 660       |       | 0                  |      | 660       |     | 660       |     | 660                                  |      | 660       |     | 660                 |     | 660         |     | 660       |     | 660       |    | 660              |     |
| TOTAL HT LOSS BTU/H            |  | 3540      |       | 2168               |      | 5252      |     | 2478      |     | 1422                                 |      | 1023      |     | 1452                |     | 571         |     | 734       |     | 2264      |    | 4711             |     |
| TOTAL HT GAIN x 1.3 BTU/H      |  | 4044      |       | 1891               |      | 6853      |     | 2941      |     | 2027                                 |      | 386       |     | 1619                |     | 344         |     | 377       |     | 1603      |    | 5660             |     |

| ROOM USE                       | EXP. WALL | CLG. HT. | WIC-2 | FAM  | KT/BR | LIV  | LAUN | PWD  | FOY  | MUD  | WOB  | BAS  |
|--------------------------------|-----------|----------|-------|------|-------|------|------|------|------|------|------|------|
| FACTORS                        |           |          | 9     | 10   | 10    | 10   | 9    | 11   | 11   | 10   | 9    | 9    |
| GRS.WALL AREA                  |           |          | 45    | 400  | 470   | 210  | 72   | 86   | 264  | 80   | 488  | 936  |
| GLAZING                        |           |          | LOSS  | GAIN | LOSS  | GAIN | LOSS | GAIN | LOSS | GAIN | LOSS | GAIN |
| NORTH                          | 19.8      | 15.6     | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| EAST                           | 19.8      | 40.5     | 11    | 217  | 445   | 0    | 0    | 0    | 11   | 217  | 445  | 0    |
| SOUTH                          | 19.8      | 24.3     | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| WEST                           | 19.8      | 40.5     | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| SKYLT.                         | 34.6      | 101.5    | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| DOORS                          | 23.5      | 4.3      | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| NET EXPOSED WALL               | 4.1       | 0.8      | 34    | 141  | 26    | 360  | 1492 | 271  | 393  | 1629 | 295  | 174  |
| NET EXPOSED BSMT WALL ABOVE GR | 3.3       | 0.6      | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| EXPOSED CLG                    | 1.2       | 0.6      | 45    | 54   | 26    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| NO ATTIC EXPOSED CLG           | 2.6       | 1.3      | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| EXPOSED FLOOR                  | 2.4       | 0.4      | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| BASEMENT/CRAWL HEAT LOSS       |           |          | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| SLAB ON GRADE HEAT LOSS        |           |          | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| SUBTOTAL HT LOSS               |           |          | 412   |      | 2283  |      |      |      |      |      |      |      |
| SUB TOTAL HT GAIN              |           |          |       | 497  |       | 1889 |      | 3049 |      | 1005 |      | 226  |
| LEVEL FACTOR / MULTIPLIER      |           |          | 0.20  | 0.38 | 0.30  | 0.55 | 0.30 | 0.55 | 0.30 | 0.55 | 0.30 | 0.55 |
| AIR CHANGE HEAT LOSS           |           |          | 157   |      | 1250  |      |      |      | 1186 |      | 348  |      |
| AIR CHANGE HEAT GAIN           |           |          |       | 40   |       | 153  |      | 248  |      | 82   |      | 19   |
| DUCT LOSS                      |           |          | 57    |      | 0     |      |      |      | 0    |      | 0    |      |
| DUCT GAIN                      |           |          |       | 54   |       | 0    |      | 0    |      | 0    |      | 0    |
| HEAT GAIN PEOPLE               | 240       |          | 0     | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| HEAT GAIN APPLIANCES/LIGHTS    |           |          |       | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| TOTAL HT LOSS BTU/H            |           |          | 627   |      | 3533  |      | 4934 |      | 2218 |      | 753  |      |
| TOTAL HT GAIN x 1.3 BTU/H      |           |          | 769   |      | 3514  |      | 5144 |      | 2271 |      | 1175 |      |

TOTAL HEAT GAIN BTU/H:

49038

TONS: 4.09

LOSS DUE TO VENTILATION LOAD BTU/H: 1819

STRUCTURAL HEAT LOSS: 85464

TOTAL COMBINED HEAT LOSS BTU/H: 67262

SITE NAME: RUSSEL GARDENS PH. 4  
BUILDER: GREENPARK HOMES

TYPE: GRANDVILLE 2

DATE: Aug-21

GFA: 4178 LO# 90144

HEATING CFM 1396 COOLING CFM 1396  
TOTAL HEAT LOSS 65,464 TOTAL HEAT GAIN 48,709  
AIR FLOW RATE CFM 21.32 AIR FLOW RATE CFM 28.66

furnace pressure 0.6  
furnace filter 0.05  
a/c coil pressure 0.2  
available pressure for s/a & r/a 0.35

plenum pressure s/a 0.18  
max s/a d/f press. loss 0.02  
min adjusted pressure s/a 0.16

r/a pressure 0.17  
r/a grille press. Loss 0.02  
adjusted pressure r/a 0.15

~\*GOODMAN  
GMVC960804CNA 80  
FAN SPEED LOW 1300  
MEDIUM 1389  
MEDIUM HIGH 0  
HIGH 1396

AFUE = 96 %  
INPUT (BTU/H) = 80,000  
OUTPUT (BTU/H) = 76,800

DESIGN CFM = 1396  
CFM @ .5" E.S.P.

TEMPERATURE RISE 51 °F

| RUN COUNT | 4th | 3rd | 2nd | 1st | Bas |
|-----------|-----|-----|-----|-----|-----|
| S/A       | 0   | 0   | 16  | 11  | 6   |
| R/A       | 0   | 0   | 5   | 4   | 1   |

All S/A diffusers 4"x10" unless noted otherwise on layout.

All S/A runs 5"Ø unless noted otherwise on layout.

| RUN #                     | 1    | 2    | 3     | 4     | 5     | 6     | 7     | 8    | 9     | 10   | 11    | 12    | 13   | 14    | 15    | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23   | 24   |
|---------------------------|------|------|-------|-------|-------|-------|-------|------|-------|------|-------|-------|------|-------|-------|------|------|------|------|------|------|------|------|------|
| ROOM NAME                 | MBR  | ENS  | BED-2 | BED-2 | BED-3 | BED-4 | ENS-2 | FLEX | ENS-3 | MBR  | ENS-4 | WIC-2 | FAM  | KT/BR | KT/BR | LIV  | LAUN | PWD  | FOY  | MUD  | BAS  | BAS  | BAS  | BAS  |
| RM LOSS MBH               | 1.77 | 1.09 | 1.75  | 1.75  | 1.24  | 1.42  | 1.02  | 1.45 | 0.57  | 1.77 | 0.73  | 0.63  | 1.77 | 2.47  | 2.47  | 2.22 | 0.75 | 0.73 | 3.35 | 0.98 | 3.78 | 3.78 | 3.78 | 3.78 |
| CFM PER RUN HEAT          | 38   | 23   | 37    | 37    | 26    | 30    | 22    | 31   | 12    | 38   | 18    | 13    | 38   | 53    | 53    | 47   | 18   | 16   | 71   | 21   | 81   | 81   | 81   | 81   |
| RM GAIN MBH               | 2.02 | 0.85 | 2.28  | 2.28  | 1.47  | 2.03  | 0.39  | 1.52 | 0.34  | 2.02 | 0.38  | 0.77  | 1.78 | 2.57  | 2.57  | 2.27 | 1.18 | 0.32 | 1.18 | 0.16 | 1.12 | 1.12 | 1.12 | 1.12 |
| CFM PER RUN COOLING       | 58   | 24   | 65    | 65    | 42    | 58    | 11    | 44   | 10    | 58   | 11    | 22    | 50   | 74    | 74    | 65   | 34   | 9    | 34   | 5    | 32   | 32   | 32   | 32   |
| ADJUSTED PRESSURE         | 0.17 | 0.17 | 0.17  | 0.17  | 0.17  | 0.17  | 0.17  | 0.17 | 0.17  | 0.17 | 0.17  | 0.17  | 0.17 | 0.17  | 0.17  | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 |
| ACTUAL DUCT LGH.          | 60   | 69   | 31    | 31    | 54    | 75    | 22    | 32   | 84    | 49   | 69    | 32    | 68   | 52    | 44    | 41   | 32   | 53   | 49   | 19   | 79   | 52   | 52   | 24   |
| EQUIVALENT LENGTH         | 150  | 190  | 170   | 150   | 170   | 200   | 180   | 170  | 200   | 160  | 150   | 160   | 110  | 110   | 110   | 140  | 150  | 160  | 170  | 150  | 130  | 130  | 130  | 130  |
| TOTAL EFFECTIVE LENGTH    | 210  | 259  | 201   | 181   | 224   | 275   | 202   | 202  | 284   | 209  | 219   | 192   | 178  | 162   | 154   | 181  | 182  | 213  | 219  | 169  | 209  | 182  | 182  | 154  |
| ADJUSTED PRESSURE         | 0.08 | 0.07 | 0.09  | 0.1   | 0.08  | 0.06  | 0.09  | 0.09 | 0.06  | 0.08 | 0.08  | 0.09  | 0.1  | 0.11  | 0.11  | 0.1  | 0.09 | 0.08 | 0.08 | 0.1  | 0.08 | 0.09 | 0.09 | 0.11 |
| ROUND DUCT SIZE           | 6    | 4    | 5     | 5     | 5     | 8     | 4     | 6    | 4     | 6    | 4     | 4     | 5    | 6     | 6     | 5    | 4    | 4    | 6    | 4    | 6    | 6    | 6    | 6    |
| HEATING VELOCITY (ft/min) | 194  | 264  | 272   | 272   | 191   | 153   | 252   | 158  | 138   | 194  | 184   | 149   | 279  | 270   | 270   | 345  | 184  | 184  | 362  | 241  | 413  | 413  | 413  | 413  |
| COOLING VELOCITY (ft/min) | 296  | 275  | 477   | 477   | 308   | 296   | 126   | 224  | 115   | 296  | 126   | 252   | 367  | 377   | 377   | 477  | 390  | 103  | 173  | 57   | 163  | 163  | 163  | 163  |
| OUTLET GRILL SIZE         | 4X10 | 3X10 | 3X10  | 3X10  | 3X10  | 4X10  | 3X10  | 4X10 | 3X10  | 4X10 | 3X10  | 3X10  | 3X10 | 4X10  | 4X10  | 3X10 | 3X10 | 3X10 | 4X10 | 3X10 | 4X10 | 4X10 | 4X10 | 4X10 |
| TRUNK                     | D    | C    | H     | H     | H     | C     | H     | D    | C     | D    | C     | H     | A    | B     | B     | G    | D    | F    | G    | G    | A    | A    | B    | B    |

| RUN #                     | 25   | 26   | 27    | 28    | 29   | 30   | 31    | 32    | 33   |
|---------------------------|------|------|-------|-------|------|------|-------|-------|------|
| ROOM NAME                 | BAS  | BAS  | BED-2 | BED-3 | ENS  | DIN  | LB/OF | LB/OF | FAM  |
| RM LOSS MBH               | 3.78 | 3.78 | 1.75  | 1.24  | 1.09 | 2.28 | 2.36  | 2.36  | 1.77 |
| CFM PER RUN HEAT          | 81   | 81   | 37    | 26    | 23   | 48   | 50    | 50    | 38   |
| RM GAIN MBH               | 1.12 | 1.12 | 2.28  | 1.47  | 0.85 | 1.60 | 2.83  | 2.83  | 1.76 |
| CFM PER RUN COOLING       | 32   | 32   | 65    | 42    | 24   | 46   | 81    | 81    | 50   |
| ADJUSTED PRESSURE         | 0.16 | 0.16 | 0.17  | 0.17  | 0.17 | 0.17 | 0.16  | 0.16  | 0.17 |
| ACTUAL DUCT LGH.          | 41   | 48   | 33    | 51    | 80   | 11   | 60    | 68    | 56   |
| EQUIVALENT LENGTH         | 130  | 170  | 150   | 170   | 170  | 130  | 160   | 150   | 130  |
| TOTAL EFFECTIVE LENGTH    | 171  | 219  | 183   | 221   | 250  | 141  | 220   | 218   | 186  |
| ADJUSTED PRESSURE         | 0.09 | 0.07 | 0.09  | 0.08  | 0.07 | 0.12 | 0.07  | 0.07  | 0.09 |
| ROUND DUCT SIZE           | 6    | 6    | 5     | 5     | 4    | 5    | 6     | 6     | 5    |
| HEATING VELOCITY (ft/min) | 413  | 413  | 272   | 191   | 264  | 352  | 255   | 255   | 279  |
| COOLING VELOCITY (ft/min) | 163  | 163  | 477   | 308   | 275  | 338  | 413   | 413   | 367  |
| OUTLET GRILL SIZE         | 4X10 | 4X10 | 3X10  | 3X10  | 3X10 | 3X10 | 4X10  | 4X10  | 3X10 |
| TRUNK                     | G    | F    | H     | H     | C    | B    | F     | F     | A    |

| SUPPLY AIR TRUNK SIZE |              |                  |               |              |   |                      |         |              |                  | RETURN AIR TRUNK SIZE |              |   |                      |         |              |                  |               |              |    |                      |    |     |
|-----------------------|--------------|------------------|---------------|--------------|---|----------------------|---------|--------------|------------------|-----------------------|--------------|---|----------------------|---------|--------------|------------------|---------------|--------------|----|----------------------|----|-----|
|                       | TRUNK<br>CFM | STATIC<br>PRESS. | ROUND<br>DUCT | RECT<br>DUCT |   | VELOCITY<br>(ft/min) |         | TRUNK<br>CFM | STATIC<br>PRESS. | ROUND<br>DUCT         | RECT<br>DUCT |   | VELOCITY<br>(ft/min) |         | TRUNK<br>CFM | STATIC<br>PRESS. | ROUND<br>DUCT | RECT<br>DUCT |    | VELOCITY<br>(ft/min) |    |     |
| TRUNK A               | 238          | 0.08             | 8.2           | 8            | x | 536                  | TRUNK G | 417          | 0.07             | 10.4                  | 12           | x | 626                  | TRUNK O | 0            | 0.05             | 0             | 0            | x  | 8                    | 0  |     |
| TRUNK B               | 554          | 0.08             | 11.2          | 14           | x | 712                  | TRUNK H | 268          | 0.08             | 8.6                   | 8            | x | 8                    | 603     | TRUNK P      | 0                | 0.05          | 0            | 0  | x                    | 8  | 0   |
| TRUNK C               | 104          | 0.06             | 6.5           | 8            | x | 234                  | TRUNK I | 615          | 0.07             | 12.1                  | 18           | x | 8                    | 615     | TRUNK Q      | 0                | 0.05          | 0            | 0  | x                    | 8  | 0   |
| TRUNK D               | 371          | 0.06             | 10.4          | 12           | x | 557                  | TRUNK J | 0            | 0.00             | 0                     | 0            | x | 8                    | 0       | TRUNK R      | 0                | 0.05          | 0            | 0  | x                    | 8  | 0   |
| TRUNK E               | 781          | 0.06             | 13.7          | 22           | x | 639                  | TRUNK K | 0            | 0.00             | 0                     | 0            | x | 8                    | 0       | TRUNK S      | 0                | 0.05          | 0            | 0  | x                    | 8  | 0   |
| TRUNK F               | 197          | 0.07             | 7.9           | 8            | x | 443                  | TRUNK L | 0            | 0.00             | 0                     | 0            | x | 8                    | 0       | TRUNK T      | 0                | 0.05          | 0            | 0  | x                    | 8  | 0   |
|                       |              |                  |               |              |   |                      |         |              |                  |                       |              |   |                      |         | TRUNK U      | 0                | 0.05          | 0            | 0  | x                    | 8  | 0   |
|                       |              |                  |               |              |   |                      |         |              |                  |                       |              |   |                      |         | TRUNK V      | 0                | 0.05          | 0            | 0  | x                    | 8  | 0   |
|                       |              |                  |               |              |   |                      |         |              |                  |                       |              |   |                      |         | TRUNK W      | 0                | 0.05          | 0            | 0  | x                    | 8  | 0   |
|                       |              |                  |               |              |   |                      |         |              |                  |                       |              |   |                      |         | TRUNK X      | 1396             | 0.05          | 17.9         | 30 | x                    | 10 | 670 |
|                       |              |                  |               |              |   |                      |         |              |                  |                       |              |   |                      |         | TRUNK Y      | 795              | 0.05          | 14.5         | 24 | x                    | 8  | 596 |
|                       |              |                  |               |              |   |                      |         |              |                  |                       |              |   |                      |         | TRUNK Z      | 575              | 0.05          | 12.8         | 20 | x                    | 8  | 518 |
|                       |              |                  |               |              |   |                      |         |              |                  |                       |              |   |                      |         | DROP         | 1396             | 0.05          | 17.9         | 24 | x                    | 12 | 698 |

|                    |      |      |      |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |      |      |    |
|--------------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|----|
| RETURN AIR #       | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |       |       |       |       |       |       |       |       |       |      |      | BR |
|                    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |    |
| AIR VOLUME         | 115  | 85   | 85   | 130  | 130  | 290  | 155  | 105  | 85   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 216  |    |
| PLENUM PRESSURE    | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15 | 0.15 |    |
| ACTUAL DUCT LGH.   | 69   | 46   | 58   | 57   | 80   | 65   | 63   | 27   | 53   | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1    | 14   |    |
| EQUIVALENT LENGTH  | 205  | 195  | 195  | 165  | 185  | 210  | 205  | 165  | 185  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 135  |    |
| TOTAL EFFECTIVE LH | 274  | 241  | 251  | 222  | 265  | 275  | 268  | 192  | 238  | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1    | 149  |    |
| ADJUSTED PRESSURE  | 0.05 | 0.06 | 0.06 | 0.07 | 0.06 | 0.05 | 0.06 | 0.08 | 0.08 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 0.10 | 0.10 |    |
| ROUND DUCT SIZE    | 7    | 6    | 6    | 6.8  | 7    | 9.9  | 7.5  | 6    | 6    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 7.5  |    |
| INLET GRILL SIZE   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 8    |    |
|                    | X    | X    | X    | X    | X    | X    | X    | X    | X    | X     | X     | X     | X     | X     | X     | X     | X     | X     | X    | X    |    |
| INLET GRILL SIZE   | 14   | 14   | 14   | 14   | 14   | 30   | 14   | 14   | 14   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 14   |    |

| RETURN AIR #       | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | BR    |
|--------------------|------|------|------|------|------|------|------|------|------|-------|
| AIR VOLUME         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0     |
| PLENUM PRESSURE    | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15  |
| ACTUAL DUCT LGH.   | 69   | 46   | 56   | 57   | 80   | 65   | 63   | 27   | 53   | 1     |
| EQUIVALENT LENGTH  | 205  | 195  | 195  | 165  | 185  | 210  | 205  | 165  | 185  | 0     |
| TOTAL EFFECTIVE LH | 274  | 241  | 251  | 222  | 265  | 275  | 268  | 192  | 238  | 1     |
| ADJUSTED PRESSURE  | 0.05 | 0.06 | 0.06 | 0.07 | 0.06 | 0.05 | 0.06 | 0.08 | 0.06 | 14.80 |
| ROUND DUCT SIZE    | 7    | 6    | 6    | 6.8  | 7    | 9.9  | 7.5  | 6    | 6    | 0     |
| INLET GRILL SIZE   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 0     |
| INLET GRILL SIZE   | X    | X    | X    | X    | X    | X    | X    | X    | X    | 0     |
| INLET GRILL SIZE   | 14   | 14   | 14   | 14   | 14   | 30   | 14   | 14   | 14   | 0     |

TYPE: GRANDVILLE 2  
SITE NAME: RUSSEL GARDENS PH. 4

LO # 90144

**RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY**

|                              |                                                                               |             |
|------------------------------|-------------------------------------------------------------------------------|-------------|
| <b>COMBUSTION APPLIANCES</b> |                                                                               | 9.32.3.1(1) |
| a)                           | <input checked="" type="checkbox"/> Direct vent (sealed combustion) only      |             |
| b)                           | <input type="checkbox"/> Positive venting induced draft (except fireplaces)   |             |
| c)                           | <input type="checkbox"/> Natural draft, B-vent or induced draft gas fireplace |             |
| d)                           | <input type="checkbox"/> Solid Fuel (including fireplaces)                    |             |
| e)                           | <input type="checkbox"/> No Combustion Appliances                             |             |

|                                                |                                         |
|------------------------------------------------|-----------------------------------------|
| <b>HEATING SYSTEM</b>                          |                                         |
| <input checked="" type="checkbox"/> Forced Air | <input type="checkbox"/> Non Forced Air |
| <input type="checkbox"/> Electric Space Heat   |                                         |

|                                     |                                                         |           |
|-------------------------------------|---------------------------------------------------------|-----------|
| <b>HOUSE TYPE</b>                   |                                                         | 9.32.1(2) |
| <input checked="" type="checkbox"/> | I Type a) or b) appliance only, no solid fuel           |           |
| <input type="checkbox"/>            | II Type I except with solid fuel (including fireplaces) |           |
| <input type="checkbox"/>            | III Any Type c) appliance                               |           |
| <input type="checkbox"/>            | IV Type I, or II with electric space heat               |           |
| <input type="checkbox"/>            | Other: Type I, II or IV no forced air                   |           |

|                                     |                                                 |            |
|-------------------------------------|-------------------------------------------------|------------|
| <b>SYSTEM DESIGN OPTIONS</b>        |                                                 | O.N.H.W.P. |
| <input type="checkbox"/>            | 1 Exhaust only/Forced Air System                |            |
| <input type="checkbox"/>            | 2 HRV with Ducting/Forced Air System            |            |
| <input checked="" type="checkbox"/> | 3 HRV Simplified/connected to forced air system |            |
| <input type="checkbox"/>            | 4 HRV with Ducting/non forced air system        |            |
| <input type="checkbox"/>            | Part 6 Design                                   |            |

|                                   |              |             |
|-----------------------------------|--------------|-------------|
| <b>TOTAL VENTILATION CAPACITY</b> |              | 9.32.3.3(1) |
| Basement + Master Bedroom         | 2 @ 21.2 cfm | 42.4 cfm    |
| Other Bedrooms                    | 4 @ 10.6 cfm | 42.4 cfm    |
| Kitchen & Bathrooms               | 6 @ 10.6 cfm | 63.6 cfm    |
| Other Rooms                       | 8 @ 10.6 cfm | 84.8 cfm    |
| Table 9.32.3.A.                   | TOTAL        | 233.2 cfm   |

|                                                |      |              |
|------------------------------------------------|------|--------------|
| <b>PRINCIPAL VENTILATION CAPACITY REQUIRED</b> |      | 9.32.3.4.(1) |
| 1 Bedroom                                      | 31.8 | cfm          |
| 2 Bedroom                                      | 47.7 | cfm          |
| 3 Bedroom                                      | 63.6 | cfm          |
| 4 Bedroom                                      | 79.5 | cfm          |
| 5 Bedroom                                      | 95.4 | cfm          |
| TOTAL                                          |      | 95.4 cfm     |

|                                          |       |           |
|------------------------------------------|-------|-----------|
| <b>SUPPLEMENTAL VENTILATION CAPACITY</b> |       | 9.32.3.5. |
| Total Ventilation Capacity               | 233.2 | cfm       |
| Less Principal Ventll. Capacity          | 95.4  | cfm       |
| Required Supplemental Capacity           | 137.8 | cfm       |

|                                                |                                                  |        |        |
|------------------------------------------------|--------------------------------------------------|--------|--------|
| <b>PRINCIPAL EXHAUST FAN CAPACITY</b>          |                                                  |        |        |
| Model: VANEV V150H                             | Location: BSMT                                   |        |        |
| 95.4 cfm                                       | <input checked="" type="checkbox"/> HVI Approved |        |        |
| <b>PRINCIPAL EXHAUST HEAT LOSS CALCULATION</b> |                                                  |        |        |
| CFM                                            | ΔT °F                                            | FACTOR | % LOSS |
| 95.4 CFM                                       | X 71 F                                           | X 1.08 | X 0.25 |

|                          |                          |                                 |     |
|--------------------------|--------------------------|---------------------------------|-----|
| <b>SUPPLEMENTAL FANS</b> |                          | <b>BY INSTALLING CONTRACTOR</b> |     |
| Location                 | Model                    | cfm                             | HVI |
| ENS                      | BY INSTALLING CONTRACTOR | 50                              | ✓   |
| ENS-2                    | BY INSTALLING CONTRACTOR | 50                              | ✓   |
| ENS-4                    | BY INSTALLING CONTRACTOR | 50                              | ✓   |
| PWD                      | BY INSTALLING CONTRACTOR | 50                              | ✓   |

|                                 |                                                  |            |
|---------------------------------|--------------------------------------------------|------------|
| <b>HEAT RECOVERY VENTILATOR</b> |                                                  | 9.32.3.11. |
| Model: VANEV V150H              |                                                  |            |
| 150 cfm high                    | 35 cfm low                                       |            |
| 75 % Sensible Efficiency        | <input checked="" type="checkbox"/> HVI Approved |            |
| @ 32 deg F (0 deg C)            |                                                  |            |

|                                 |                   |
|---------------------------------|-------------------|
| <b>LOCATION OF INSTALLATION</b> |                   |
| Lot:                            | Concession        |
| Township                        | Plan:             |
| Address                         |                   |
| Roll #                          | Building Permit # |

|                                 |        |
|---------------------------------|--------|
| <b>BUILDER:</b> GREENPARK HOMES |        |
| Name:                           |        |
| Address:                        |        |
| City:                           |        |
| Telephone #:                    | Fax #: |

|                              |        |
|------------------------------|--------|
| <b>INSTALLING CONTRACTOR</b> |        |
| Name:                        |        |
| Address:                     |        |
| City:                        |        |
| Telephone #:                 | Fax #: |

|                                                                                                               |                         |
|---------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>DESIGNER CERTIFICATION</b>                                                                                 |                         |
| I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code. |                         |
| Name:                                                                                                         | HVAC Designs Ltd.       |
| Signature:                                                                                                    | <i>Michael O'Rourke</i> |
| HRAI #                                                                                                        | 001820                  |
| Date:                                                                                                         | August-21               |

| CSA F280-12 Residential Heat Loss and Heat Gain Calculations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------|--|-------|------------------|-------------------|-----------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|---|-------|--------|-------|-------|-------|--------|--------|-------|-------|-------|--------|-------|---|--------|---|-------|---|---|---|--------|--------------|--|--|--------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|---------------------------|--|--------------------------------|-------|--------------------------------|-------|-------------------------------|--|--|--|--|--|--------|---------|-------|-------|-------------|----|-----|----|----|-------------|----|----|---|----|
| Formula Sheet (For Air Leakage / Ventilation Calculation)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| LO#: 90144                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   | Model: GRANDVILLE 2                                 |                                                    | Builder: GREENPARK HOMES                                  |                                                                                                                                                                                       |  | Date: 2021-08-31 |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>Volume Calculation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                                                     |                                                    |                                                           | <b>Air Change &amp; Delta T Data</b>                                                                                                                                                  |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">House Volume</th> </tr> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>2059</td> <td>9</td> <td>18531</td> </tr> <tr> <td>First</td> <td>2059</td> <td>10</td> <td>20590</td> </tr> <tr> <td>Second</td> <td>2119</td> <td>9</td> <td>19071</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="2"></td> <td>Total:</td> <td>58,192.0 ft³</td> </tr> <tr> <td colspan="2"></td> <td>Total:</td> <td>1647.8 m³</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                         |                   |                                                     |                                                    |                                                           | House Volume                                                                                                                                                                          |  |                  |  | Level | Floor Area (ft²) | Floor Height (ft) | Volume (ft³)                                        | Bsmt                                               | 2059                                                      | 9 | 18531 | First  | 2059  | 10    | 20590 | Second | 2119   | 9     | 19071 | Third | 0      | 9     | 0 | Fourth | 0 | 9     | 0 |   |   | Total: | 58,192.0 ft³ |  |  | Total: | 1647.8 m³ | <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Air Change &amp; Delta T Data</th> </tr> </thead> <tbody> <tr> <td>WINTER NATURAL AIR CHANGE RATE</td> <td>0.365</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.130</td> </tr> </tbody> </table><br><table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> </thead> <tbody> <tr> <td>Winter DTDh</td> <td>22</td> <td>-17</td> <td>39</td> <td>71</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </tbody> </table> |  |  |  |  | Air Change & Delta T Data |  | WINTER NATURAL AIR CHANGE RATE | 0.365 | SUMMER NATURAL AIR CHANGE RATE | 0.130 | Design Temperature Difference |  |  |  |  |  | Tin °C | Tout °C | ΔT °C | ΔT °F | Winter DTDh | 22 | -17 | 39 | 71 | Summer DTDc | 24 | 31 | 7 | 13 |
| House Volume                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Floor Area (ft²)  | Floor Height (ft)                                   | Volume (ft³)                                       |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Bsmt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2059              | 9                                                   | 18531                                              |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| First                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2059              | 10                                                  | 20590                                              |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Second                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2119              | 9                                                   | 19071                                              |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Third                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                 | 9                                                   | 0                                                  |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Fourth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                 | 9                                                   | 0                                                  |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   | Total:                                              | 58,192.0 ft³                                       |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   | Total:                                              | 1647.8 m³                                          |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Air Change & Delta T Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| WINTER NATURAL AIR CHANGE RATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.365             |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| SUMMER NATURAL AIR CHANGE RATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0.130             |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Design Temperature Difference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Tin °C            | Tout °C                                             | ΔT °C                                              | ΔT °F                                                     |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Winter DTDh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 22                | -17                                                 | 39                                                 | 71                                                        |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Summer DTDc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 24                | 31                                                  | 7                                                  | 13                                                        |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>5.2.3.1 Heat Loss due to Air Leakage</b> $HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ <p>0.365 x 457.73 x 39 °C x 1.2 = 7857 W</p> <p>= 26808 Btu/h</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                                     |                                                    |                                                           | <b>6.2.6 Sensible Gain due to Air Leakage</b> $HG_{satb} = LR_{atrc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p>= 0.130 x 457.73 x 7 °C x 1.2 = 510 W</p> <p>= 1739 Btu/h</p> |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>5.2.3.2 Heat Loss due to Mechanical Ventilation</b> $HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>95 CFM x 71 °F x 1.08 x 0.25 = 1819 Btu/h</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |                                                     |                                                    |                                                           | <b>6.2.7 Sensible heat Gain due to Ventilation</b> $HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>95 CFM x 13 °F x 1.08 x 0.25 = 330 Btu/h</p>                         |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| $HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{ (HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel}) \}$ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairve Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL<sub>level</sub>)</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center;">26,808</td> <td>9,292</td> <td>1.443</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>14,687</td> <td>0.548</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>14,050</td> <td>0.382</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </tbody> </table> <p>*HLairbv = Air leakage heat loss + ventilation heat loss<br/> *For a balanced or supply only ventilation system HLairve = 0</p> |                   |                                                     |                                                    |                                                           |                                                                                                                                                                                       |  |                  |  |       | Level            | Level Factor (LF) | HLairve Air Leakage + Ventilation Heat Loss (Btu/h) | Level Conductive Heat Loss: (HL <sub>level</sub> ) | Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel) | 1 | 0.5   | 26,808 | 9,292 | 1.443 | 2     | 0.3    | 14,687 | 0.548 | 3     | 0.2   | 14,050 | 0.382 | 4 | 0      | 0 | 0.000 | 5 | 0 | 0 | 0.000  |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Level Factor (LF) | HLairve Air Leakage + Ventilation Heat Loss (Btu/h) | Level Conductive Heat Loss: (HL <sub>level</sub> ) | Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel) |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.5               | 26,808                                              | 9,292                                              | 1.443                                                     |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.3               |                                                     | 14,687                                             | 0.548                                                     |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.2               |                                                     | 14,050                                             | 0.382                                                     |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                 |                                                     | 0                                                  | 0.000                                                     |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                 |                                                     | 0                                                  | 0.000                                                     |                                                                                                                                                                                       |  |                  |  |       |                  |                   |                                                     |                                                    |                                                           |   |       |        |       |       |       |        |        |       |       |       |        |       |   |        |   |       |   |   |   |        |              |  |  |        |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |                           |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |

**HEAT LOSS AND GAIN SUMMARY SHEET****MODEL:** GRANDVILLE 2**BUILDER:** GREENPARK HOMES**SFQT:** 4178**LO#** 90144**SITE:** RUSSEL GARDENS PH. 4**DESIGN ASSUMPTIONS**

|                      |    |                                |    |
|----------------------|----|--------------------------------|----|
| HEATING              | °F | COOLING                        | °F |
| OUTDOOR DESIGN TEMP. | 1  | OUTDOOR DESIGN TEMP.           | 88 |
| INDOOR DESIGN TEMP.  | 72 | INDOOR DESIGN TEMP. (MAX 75°F) | 75 |

**BUILDING DATA**

|                                     |                 |                           |          |
|-------------------------------------|-----------------|---------------------------|----------|
| ATTACHMENT:                         | DETACHED        | # OF STORIES (+BASEMENT): | 3        |
| FRONT FACES:                        | EAST            | ASSUMED (Y/N):            | Y        |
| AIR CHANGES PER HOUR:               | 3.57            | ASSUMED (Y/N):            | Y        |
| AIR TIGHTNESS CATEGORY:             | AVERAGE         | ASSUMED (Y/N):            | Y        |
| WIND EXPOSURE:                      | SHELTERED       | ASSUMED (Y/N):            | Y        |
| HOUSE VOLUME (ft³):                 | 58192.0         | ASSUMED (Y/N):            | Y        |
| INTERNAL SHADING:                   | BLINDS/CURTAINS | ASSUMED OCCUPANTS:        | 6        |
| INTERIOR LIGHTING LOAD (Btu/h/ft²): | 1.27            | DC BRUSHLESS MOTOR (Y/N): | Y        |
| FOUNDATION CONFIGURATION            | BCIN_1          | DEPTH BELOW GRADE:        | 6.0 ft   |
| LENGTH: 62.0 ft                     | WIDTH: 42.0 ft  | EXPOSED PERIMETER:        | 156.0 ft |
| WOB INSULATION CONFIGURATION        | SCB_9           | WOB EXPOSED PERIMETER     | 52.0 ft  |

**2012 OBC - COMPLIANCE PACKAGE**

| Component                                                                  | Compliance Package<br>A1 |           |
|----------------------------------------------------------------------------|--------------------------|-----------|
|                                                                            | Nominal                  | Min. Eff. |
| Ceiling with Attic Space Minimum RSI (R)-Value                             | 60                       | 59.22     |
| Ceiling Without Attic Space Minimum RSI (R)-Value                          | 31                       | 27.65     |
| Exposed Floor Minimum RSI (R)-Value                                        | 31                       | 29.80     |
| Walls Above Grade Minimum RSI (R)-Value                                    | 22                       | 17.03     |
| Basement Walls Minimum RSI (R)-Value                                       | 20 ci                    | 21.12     |
| Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value | -                        | -         |
| Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value        | 10                       | 10        |
| Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value             | 10                       | 11.13     |
| Windows and Sliding Glass Doors Maximum U-Value                            | 0.28                     | -         |
| Skylights Maximum U-Value                                                  | 0.49                     | -         |
| Space Heating Equipment Minimum AFUE                                       | 96%                      | -         |
| HRV Minimum Efficiency                                                     | 75%                      | -         |
| Domestic Hot Water Heater Minimum EF                                       | 0.8                      | -         |

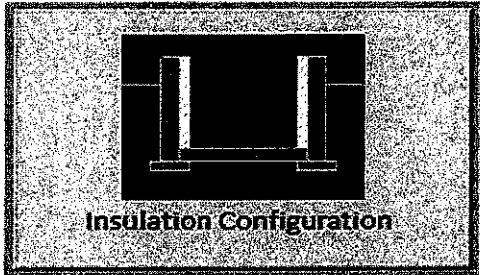
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

*Michael O'Rourke*

## Residential Foundation Thermal Load Calculator

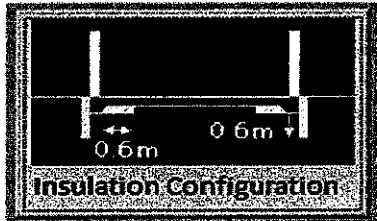
Supplemental tool for CAN/CSA-F280

| Weather Station Description    |                                           |                                                                                                                 |
|--------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Province:                      | Ontario                                   |                                                                                                                 |
| Region:                        | Hamilton                                  |                                                                                                                 |
| Site Description               |                                           |                                                                                                                 |
| Soil Conductivity:             | Normal conductivity: dry sand, loam, clay |                                                                                                                 |
| Water Table:                   | Normal (7-10 m, 23-33 ft)                 |                                                                                                                 |
| Foundation Dimensions          |                                           |                                                                                                                 |
| Floor Length (m):              | 4.6                                       | <br>Insulation Configuration |
| Floor Width (m):               | 12.8                                      |                                                                                                                 |
| Exposed Perimeter (m):         | 47.5                                      |                                                                                                                 |
| Wall Height (m):               | 2.7                                       |                                                                                                                 |
| Depth Below Grade (m):         | 1.57                                      |                                                                                                                 |
| Window Area (m <sup>2</sup> ): | 1.1                                       |                                                                                                                 |
| Door Area (m <sup>2</sup> ):   | 1.9                                       |                                                                                                                 |
| Radiant Slab                   |                                           |                                                                                                                 |
| Heated Fraction of the Slab:   | 0                                         |                                                                                                                 |
| Fluid Temperature (°C):        | 33                                        |                                                                                                                 |
| Design Months                  |                                           |                                                                                                                 |
| Heating Month                  | 1                                         |                                                                                                                 |
| Foundation Loads               |                                           |                                                                                                                 |
| Heating Load (Watts):          | 814                                       |                                                                                                                 |

TYPE: GRANDVILLE 2  
LO# 90144

## Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

| Weather Station Description  |                                           |                                                                                                                 |
|------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Province:                    | Ontario                                   |                                                                                                                 |
| Region:                      | Hamilton                                  |                                                                                                                 |
| Site Description             |                                           |                                                                                                                 |
| Soil Conductivity:           | Normal conductivity: dry sand, loam, clay |                                                                                                                 |
| Water Table:                 | Normal (7-10 m, 23-33 ft)                 |                                                                                                                 |
| Foundation Dimensions        |                                           |                                                                                                                 |
| Length (m):                  | 1.5                                       | <br>Insulation Configuration |
| Width (m):                   | 12.8                                      |                                                                                                                 |
| Exposed Perimeter (m):       | 15.8                                      |                                                                                                                 |
| Radiant Slab                 |                                           |                                                                                                                 |
| Heated Fraction of the Slab: | 0                                         |                                                                                                                 |
| Fluid Temperature (°C):      | 33                                        |                                                                                                                 |
| Design Months                |                                           |                                                                                                                 |
| Heating Month                | 1                                         |                                                                                                                 |
| Results                      |                                           |                                                                                                                 |
| Heating Load (Watts):        |                                           | <b>218</b>                                                                                                      |

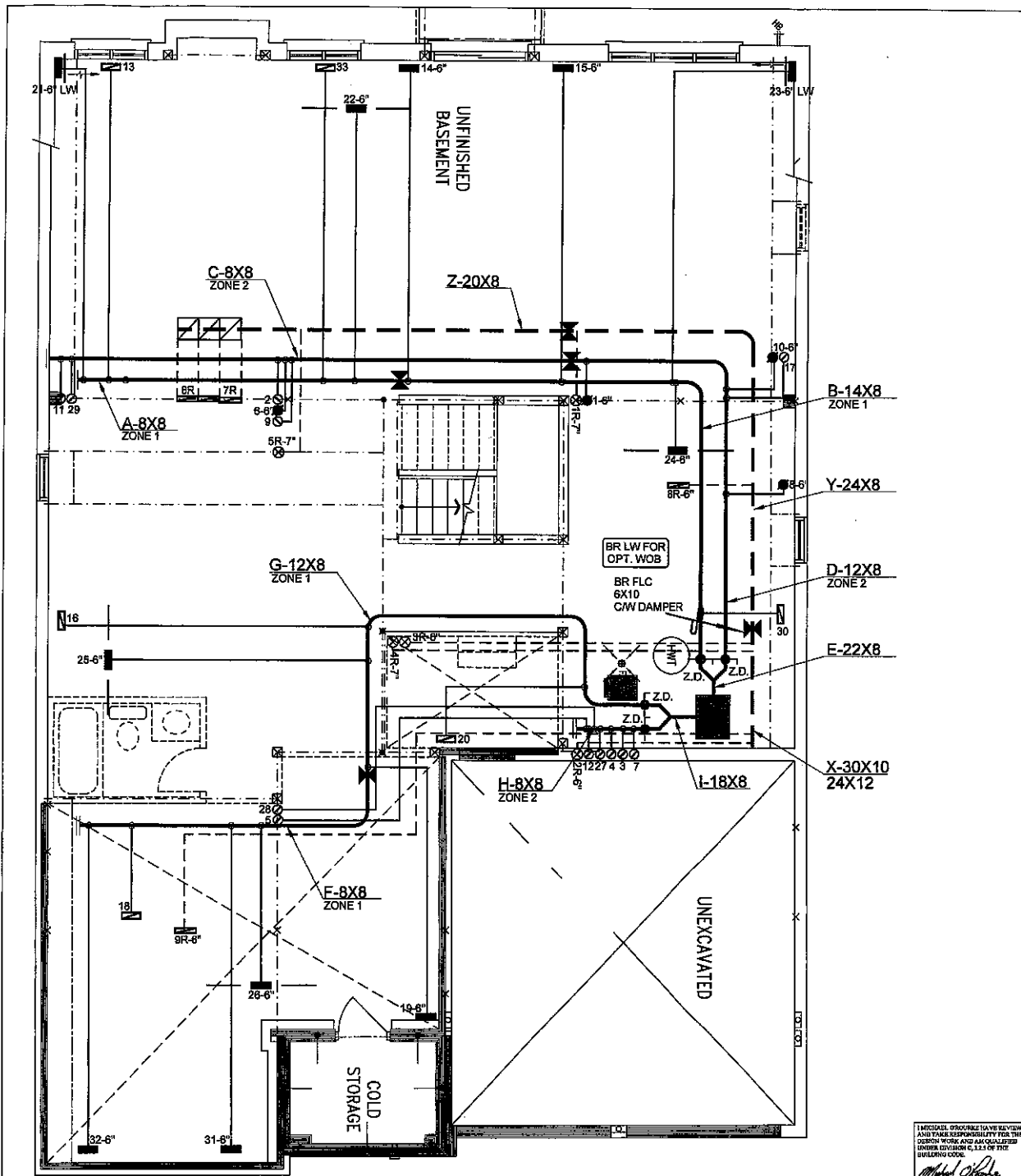
TYPE: GRANDVILLE 2  
LO# 90144

## Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

| Weather Station Description       |                            |                        |    |    |
|-----------------------------------|----------------------------|------------------------|----|----|
| Province:                         | Ontario                    |                        |    |    |
| Region:                           | Hamilton                   |                        |    |    |
| Weather Station Location:         | Open flat terrain, grass   |                        |    |    |
| Anemometer height (m):            | 10                         |                        |    |    |
| Local Shielding                   |                            |                        |    |    |
| Building Site:                    | Suburban, forest           |                        |    |    |
| Walls:                            | Heavy                      |                        |    |    |
| Flue:                             | Heavy                      |                        |    |    |
| Highest Ceiling Height (m):       | 8.53                       |                        |    |    |
| Building Configuration            |                            |                        |    |    |
| Type:                             | Detached                   |                        |    |    |
| Number of Stories:                | Two                        |                        |    |    |
| Foundation:                       | Full                       |                        |    |    |
| House Volume (m <sup>3</sup> ):   | 1647.8                     |                        |    |    |
| Air Leakage/Ventilation           |                            |                        |    |    |
| Air Tightness Type:               | Present (1961-) (3.57 ACH) |                        |    |    |
| Custom BDT Data:                  | ELA @ 10 Pa.               | 2196.6 cm <sup>2</sup> |    |    |
|                                   | 3.57                       | ACH @ 50 Pa            |    |    |
| Mechanical Ventilation (L/s):     | Total Supply               | Total Exhaust          |    |    |
|                                   | 45.0                       | 45.0                   |    |    |
| Flue Size                         |                            |                        |    |    |
| Flue #:                           | #1                         | #2                     | #3 | #4 |
| Diameter (mm):                    | 0                          | 0                      | 0  | 0  |
| Natural Infiltration Rates        |                            |                        |    |    |
| Heating Air Leakage Rate (ACH/H): | 0.365                      |                        |    |    |
| Cooling Air Leakage Rate (ACH/H): | 0.130                      |                        |    |    |

TYPE: GRANDVILLE 2  
LO# 90144



BASEMENT FLOOR PLAN ELEV. '1'

Z.D. = MECHANICAL ZONE DAMPER

|        |                          |
|--------|--------------------------|
| ZONE 1 | BASEMENT AND FIRST FLOOR |
| ZONE 2 | SECOND FLOOR             |

100% QUALITY CONTROL REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AIR QUALITY UNDER DIVISION 6, 3.2.1 OF THE BUILDING CODE.

Michael G. Rando, P.Eng. 1969  
HVAC DESIGN LTD.

**WOB**  
**CSA-F280-12**  
**PACKAGE A1**

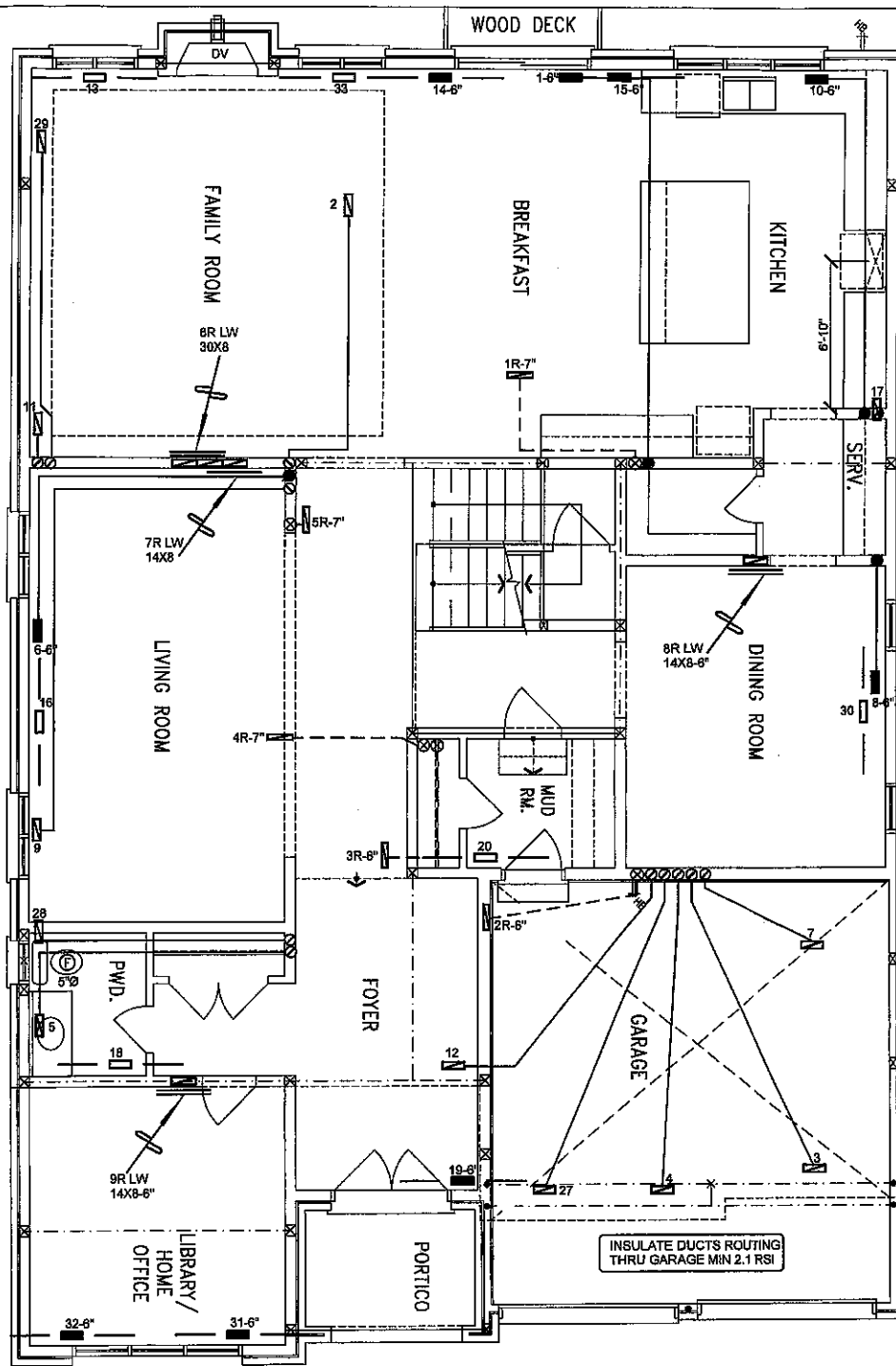
| HVAC LEGEND |                           |          |                                 |          |                              | REVISIONS |             |
|-------------|---------------------------|----------|---------------------------------|----------|------------------------------|-----------|-------------|
| SYMBOL      | DESCRIPTION               | SYMBOL   | DESCRIPTION                     | SYMBOL   | DESCRIPTION                  | No.       | Description |
| [Symbol]    | SUPPLY AIR GRILLE         | [Symbol] | 9" SUPPLY AIR BOOT ABOVE        | [Symbol] | 14"x8" RETURN AIR GRILLE     | 1.        |             |
| [Symbol]    | SUPPLY AIR GRILLE 6" BOOT | [Symbol] | SUPPLY AIR STACK FROM 2nd FLOOR | [Symbol] | 20"x8" RETURN AIR GRILLE     | 2.        |             |
| [Symbol]    | SUPPLY AIR BOOT ABOVE     | [Symbol] | 6" SUPPLY AIR STACK 2nd FLOOR   | [Symbol] | FRA- FLOOR RETURN AIR GRILLE | 3.        |             |
| [Symbol]    |                           | [Symbol] |                                 | [Symbol] | RETURN AIR STACK 2nd FLOOR   | No.       | Description |
| [Symbol]    |                           | [Symbol] |                                 | [Symbol] | REDUCER                      | Date      |             |

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Client  
**GREENPARK HOMES**  
Project Name  
**RUSSELL GARDENS PH. 4  
HAMILTON, ONTARIO**  
WOB  
GRANDVILLE 2 4178 sqft

**HVAC DESIGNS LTD.**  
375 Finley Ave. Suite 202 - Ajax, Ontario  
L1S 2E2 Tel. 905.619.2300 - 905.420.5200 Fax 905.619.2375  
Email: info@hvacdesigns.ca  
Web: www.hvacdesigns.ca  
Specializing in Residential Mechanical Design Services  
Installation to comply with the latest Ontario Building Code. All supply branch cutlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

|                                |           |           |     |     |      |                                        |
|--------------------------------|-----------|-----------|-----|-----|------|----------------------------------------|
| HEAT LOSS 67282 BTU/H          | UNIT DATA | # OF RUNS | S/A | R/A | FANS | Sheet Title                            |
| MAKE GOODMAN                   | 3RD FLOOR |           |     |     |      | <b>BASEMENT<br/>HEATING<br/>LAYOUT</b> |
| MODEL GMVC960804CNA            | 2ND FLOOR | 16        | 5   | 5   |      |                                        |
| INPUT 80 MBTUH                 | 1ST FLOOR | 11        | 4   | 2   |      |                                        |
| OUTPUT 76.8 MBTUH              | BASEMENT  | 6         | 1   | 0   |      | Date                                   |
| COOLING 4.0 (2 STAGE) TONS     |           |           |     |     |      | Scale                                  |
| FAN SPEED 1396 rpm @ 0.5" w.g. |           |           |     |     |      | AUG/2021                               |
|                                |           |           |     |     |      | BCIN# 19669                            |
|                                |           |           |     |     |      | LO# 92410                              |



GROUND FLOOR PLAN ELEV. '1'

I HEREBY CERTIFY THAT I AM A QUALIFIED PROFESSIONAL ENGINEER AND I AM QUALIFIED TO SIGN OFF ON THIS DRAWING.  
*Michael J. R. R. R.*  
 Michael J. R. R. R.  
 HVAC DESIGN LTD.

**WOB**  
**CSA-F280-12**  
**PACKAGE A1**

| HVAC LEGEND |                           |  |                                 |  |                             | 3.   |
|-------------|---------------------------|--|---------------------------------|--|-----------------------------|------|
|             | SUPPLY AIR GRILLE         |  | 6" SUPPLY AIR BOOT ABOVE        |  | 14" RETURN AIR GRILLE       | 2.   |
|             | SUPPLY AIR GRILLE 9" BOOT |  | SUPPLY AIR STACK FROM 2ND FLOOR |  | 30" RETURN AIR GRILLE       | 1.   |
|             | SUPPLY AIR BOOT ABOVE     |  | 6" SUPPLY AIR STACK 2ND FLOOR   |  | FRA-FLOOR RETURN AIR GRILLE | No.  |
|             |                           |  |                                 |  | REDUCER                     | Date |

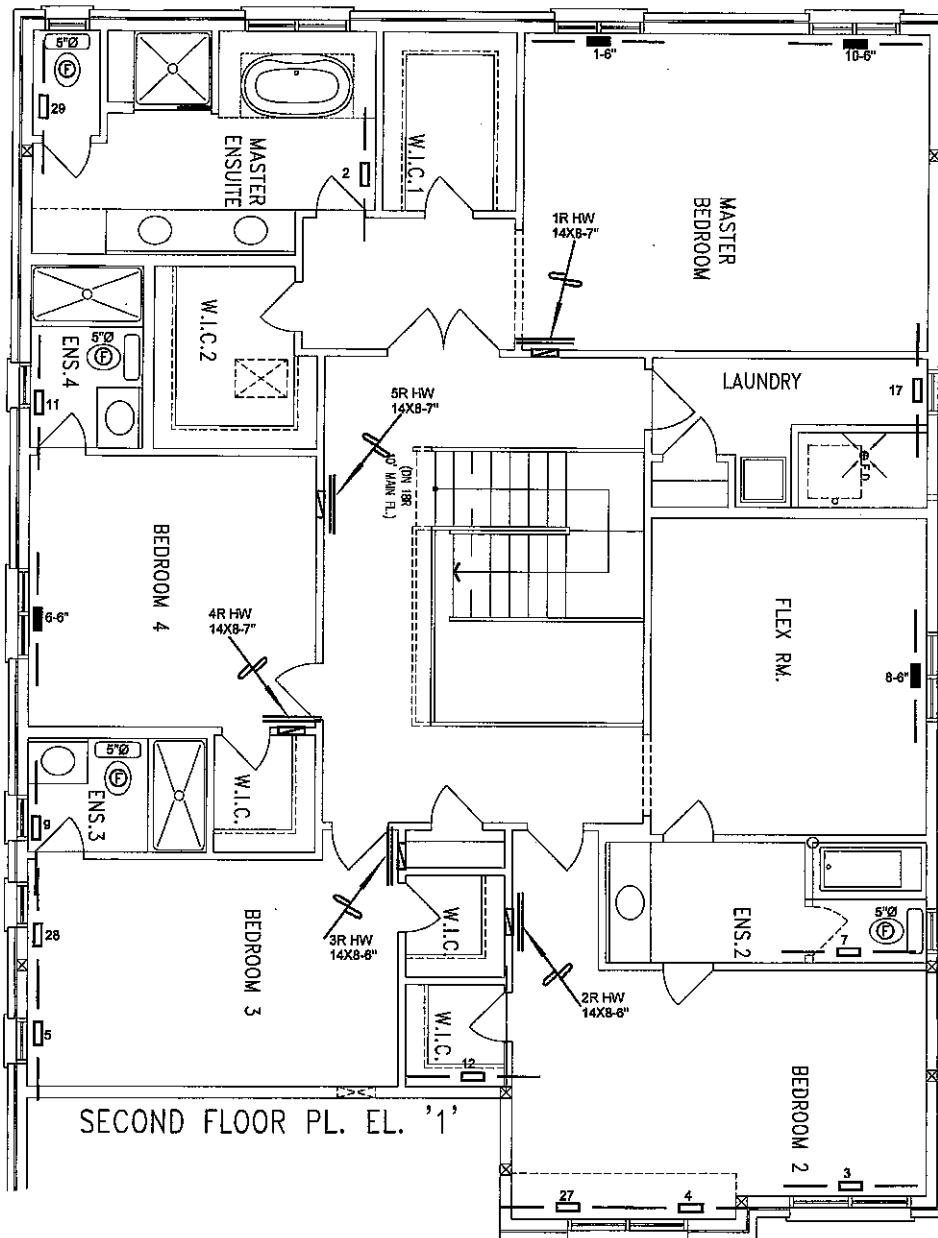
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Client  
**GREENPARK HOMES**  
 Project Name  
**RUSSELL GARDENS PH. 4**  
**HAMILTON, ONTARIO**

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 Specializing in Residential Mechanical Design Services  
 Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title  
**FIRST FLOOR**  
**HEATING**  
**LAYOUT**  
 Date **AUG/2021**  
 Scale **3/16" = 1'-0"**  
 BCIN# **19869**  
 LO# **92410**

WOB  
 GRANDVILLE 2 4178 sqft



I HEREBY UNDERTAKE TO HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.1.3.3 OF THE BUILDING CODE.

*Michael O'Rourke*  
Michael O'Rourke, P.Eng.  
HVAC DESIGN LTD.

**WOB**  
**CSA-F280-12**  
**PACKAGE A1**

| HVAC LEGEND |                           |  |                                 |  |                             |  |                            | 3.                   |
|-------------|---------------------------|--|---------------------------------|--|-----------------------------|--|----------------------------|----------------------|
|             | SUPPLY AIR GRILLE         |  | 6" SUPPLY AIR BOOT ABOVE        |  | 14" RETURN AIR GRILLE       |  | RETURN AIR STACK ABOVE     | 1.                   |
|             | SUPPLY AIR GRILLE 6" BOOT |  | SUPPLY AIR STACK FROM 2nd FLOOR |  | 30" RETURN AIR GRILLE       |  | RETURN AIR STACK 2nd FLOOR | No. Description Date |
|             | SUPPLY AIR BOOT ABOVE     |  | 6" SUPPLY AIR STACK 2nd FLOOR   |  | FRA-FLOOR RETURN AIR GRILLE |  | REDUCER                    |                      |

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Client  
**GREENPARK HOMES**

Project Name  
**RUSSELL GARDENS PH. 4  
HAMILTON, ONTARIO**

**WOB**  
**GRANDVILLE 2 4178 sqft**

**HVACDESIGNS LTD.**

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Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

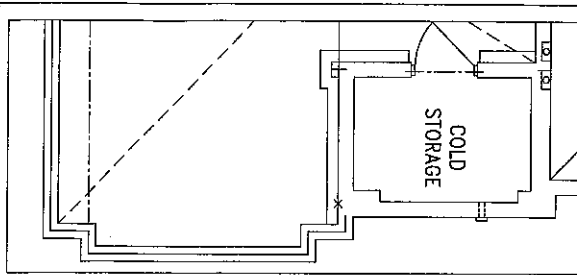
Sheet Title  
**SECOND FLOOR  
HEATING  
LAYOUT**

Date  
**AUG/2021**

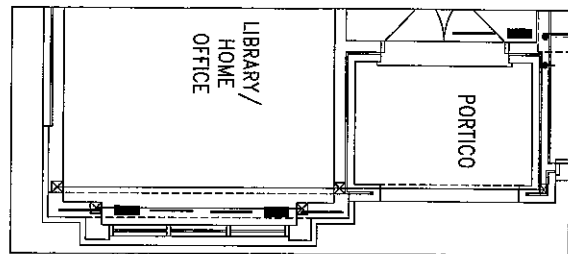
Scale  
**3/16" = 1'-0"**

BCIN# 19669

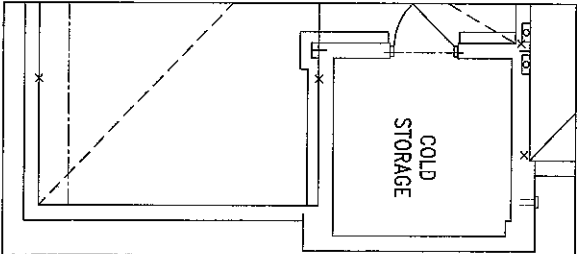
LO# 92410



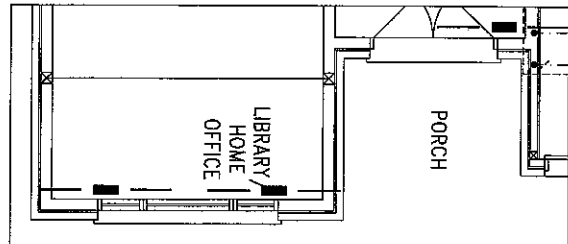
BASEMENT FLOOR PLAN ELEV. '2'



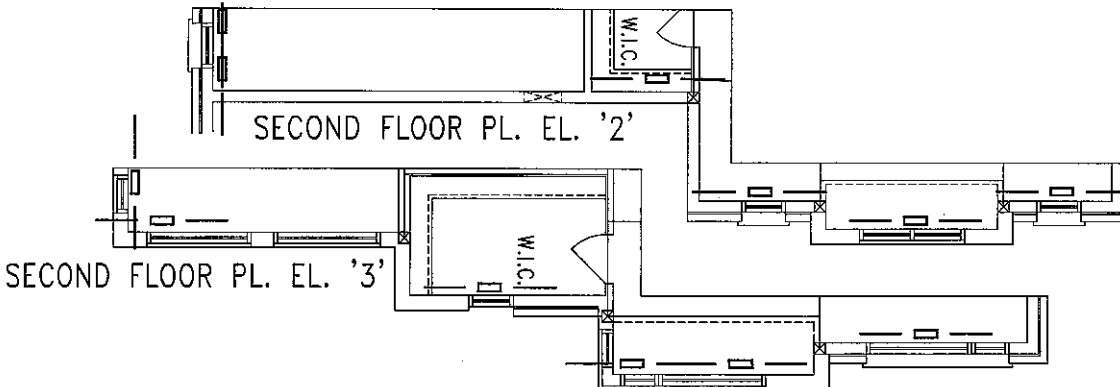
GROUND FLOOR PLAN ELEV. '2'



BASEMENT FLOOR PLAN ELEV. '3'

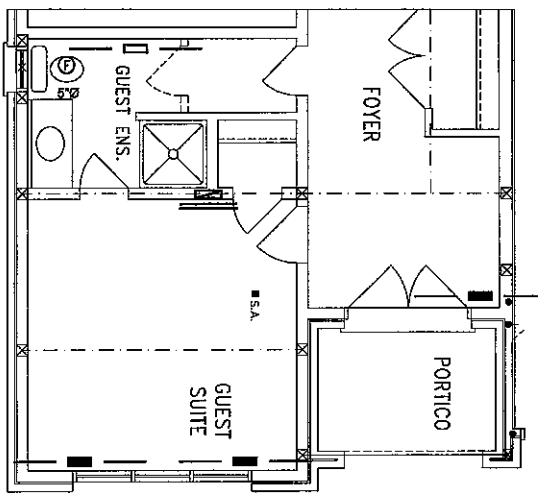


GROUND FLOOR PLAN ELEV. '3'

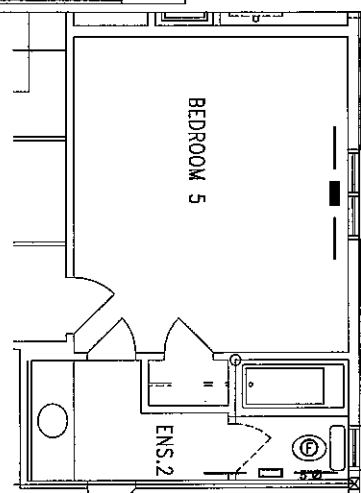


SECOND FLOOR PL. EL. '2'

SECOND FLOOR PL. EL. '3'



PART. GROUND FLOOR PLAN  
W/ OPT. GUEST SUITE ELEV. '1'



PART. SECOND FLOOR PLAN  
W/ OPT. BEDROOM 5

I, MICHAEL CHADWICK HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AN QUALIFIED ENGINEER HAS REVIEWED ALL OF THE BUILDING CODE.

**WOB**  
**CSA-F280-12**  
**PACKAGE A1**

| HVAC LEGEND |                           |        |                                 |        |                             | 3.  |             |
|-------------|---------------------------|--------|---------------------------------|--------|-----------------------------|-----|-------------|
| SYMBOL      | DESCRIPTION               | SYMBOL | DESCRIPTION                     | SYMBOL | DESCRIPTION                 | 2.  |             |
|             | SUPPLY AIR GRILLE         |        | 8" SUPPLY AIR BOOT ABOVE        |        | 14" RETURN AIR GRILLE       | 1.  |             |
|             | SUPPLY AIR GRILLE 6" BOOT |        | SUPPLY AIR STACK FROM 2nd FLOOR |        | 30" RETURN AIR GRILLE       | No. | Description |
|             | SUPPLY AIR BOOT ABOVE     |        | 8" SUPPLY AIR STACK 2nd FLOOR   |        | FRA-FLOOR RETURN AIR GRILLE |     |             |
|             |                           |        |                                 |        | REDUCER                     |     |             |

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|                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |  |
|--------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--|
| Client<br><b>GREENPARK HOMES</b>                                   |  | <div><b>HVAC</b>DESIGNS LTD.</div> <div>376 Finley Ave. Suite 202 - Ajax, Ontario<br/>L1S 2E2 Tel. 905.819.2300 - 905.420.5300 Fax 905.819.2375<br/>Email: info@hvacdesigns.ca<br/>Web: www.hvacdesigns.ca<br/>Specializing in Residential Mechanical Design Services</div> <div>Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.</div> | Sheet Title<br><b>OPTIONAL HEATING LAYOUT</b> |  |
| Project Name<br><b>RUSSELL GARDENS PH. 4<br/>HAMILTON, ONTARIO</b> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Date<br><b>AUG/2021</b>                       |  |
| WOB<br><b>GRANDVILLE 2    4178 sqft</b>                            |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Scale<br><b>3/16" = 1'-0"</b>                 |  |
|                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | BCIN# 19669                                   |  |
|                                                                    |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | LO# 92410                                     |  |