

SITE NAME: RUSSEL GARDENS PHASE 3

BUILDER: GREENPARK HOMES

TYPE: MOUNTAINASH 4

GFA: 3190

DATE: May-20

LO# 85967

WINTER NATURAL AIR CHANGE RATE 0.338

SUMMER NATURAL AIR CHANGE RATE 0.121

HEAT LOSS AT °F. 71

HEAT GAIN AT °F. 13

CSA-F280-12

SB-12 PACKAGE A1

| BUILDING: GREENPARK HOMES      |  |           |       |           | TYPE: MOUNTAINASH 4 |           |      |           |      | GFA: 3190 |      |           |      |           | LO# 85967 |           |      |      |      | SUMMER NATURAL AIR CHANGE RATE 0.121 |      |      |      |       | HEAT GAIN AT °F. 13 |           |     | SB-12 PACKAGE A |  |
|--------------------------------|--|-----------|-------|-----------|---------------------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|-----------|-----------|------|------|------|--------------------------------------|------|------|------|-------|---------------------|-----------|-----|-----------------|--|
| ROOM USE                       |  |           |       | MBR       |                     | ENS       |      | FLEX      |      | BED-2     |      | BED-3     |      | BED-4     |           | ENS-3     |      |      |      |                                      |      |      |      | S-ENS |                     |           |     |                 |  |
| EXP. WALL                      |  |           |       | 40        |                     | 28        |      | 44        |      | 14        |      | 30        |      | 13        |           | 6         |      |      |      |                                      |      |      |      | 6     |                     |           |     |                 |  |
| CLG. HT.                       |  |           |       | 9         |                     | 9         |      | 9         |      | 9         |      | 9         |      | 9         |           | 9         |      |      |      |                                      |      |      |      | 9     |                     |           |     |                 |  |
| FACTORS                        |  |           |       |           |                     |           |      |           |      |           |      |           |      |           |           |           |      |      |      |                                      |      |      |      |       |                     |           |     |                 |  |
| GRS.WALL AREA                  |  | LOSS GAIN |       | 360       |                     | 252       |      | 396       |      | 126       |      | 270       |      | 117       |           | 54        |      |      |      |                                      |      |      |      |       |                     |           |     |                 |  |
| GLAZING                        |  |           |       | LOSS GAIN |                     | LOSS GAIN |      | LOSS GAIN |      | LOSS GAIN |      | LOSS GAIN |      | LOSS GAIN |           | LOSS GAIN |      |      |      |                                      |      |      |      | 54    |                     | LOSS GAIN |     |                 |  |
| NORTH                          |  | 19.8      | 15.1  | 0         | 0                   | 0         | 14   | 277       | 212  | 0         | 0    | 0         | 16   | 316       | 242       | 0         | 0    | 0    | 0    | 0                                    | 0    | 0    | 0    | 0     | 0                   | 7         | 138 | 106             |  |
| EAST                           |  | 19.8      | 39.0  | 0         | 0                   | 0         | 0    | 0         | 0    | 72        | 1423 | 2809      | 0    | 0         | 0         | 57        | 1127 | 2224 | 0    | 0                                    | 0    | 0    | 0    | 0     | 0                   | 0         | 0   | 0               |  |
| SOUTH                          |  | 19.8      | 23.5  | 0         | 0                   | 0         | 0    | 0         | 0    | 0         | 0    | 0         | 0    | 0         | 0         | 0         | 0    | 0    | 16   | 316                                  | 376  | 7    | 138  | 164   | 0                   | 0         | 0   |                 |  |
| WEST                           |  | 19.8      | 39.0  | 32        | 633                 | 1249      | 14   | 277       | 546  | 0         | 0    | 0         | 0    | 0         | 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    | 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    | 0    | 0     | 0                   | 0         | 0   |                 |  |
| NET EXPOSED WALL               |  | 4.1       | 0.8   | 328       | 1360                | 247       | 224  | 929       | 168  | 324       | 1343 | 244       | 110  | 456       | 83        | 213       | 883  | 160  | 101  | 419                                  | 76   | 47   | 195  | 35    | 0                   | 0         | 0   |                 |  |
| 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    | 0    | 0     | 0                   | 0         | 0   |                 |  |
| EXPOSED CLG                    |  | 1.2       | 0.6   | 384       | 458                 | 226       | 182  | 229       | 113  | 189       | 225  | 111       | 251  | 299       | 147       | 196       | 234  | 115  | 200  | 238                                  | 118  | 96   | 114  | 56    | 0                   | 0         | 0   |                 |  |
| NO ATTIC EXPOSED CLG           |  | 2.6       | 1.3   | 0         | 0                   | 0         | 0    | 0         | 0    | 30        | 77   | 38        | 0    | 0         | 0         | 20        | 51   | 25   | 0    | 0                                    | 0    | 0    | 0    | 0     | 114                 | 136       | 67  |                 |  |
| EXPOSED FLOOR                  |  | 2.4       | 0.4   | 0         | 0                   | 0         | 0    | 0         | 0    | 20        | 47   | 9         | 69   | 163       | 30        | 216       | 512  | 93   | 0    | 0                                    | 0    | 0    | 0    | 0     | 114                 | 270       | 49  |                 |  |
| BASEMENT/CRAWL HEAT LOSS       |  |           |       | 0         |                     |           | 0    |           |      | 0         |      |           | 0    |           |           | 0         |      |      | 0    |                                      |      |      |      | 0     |                     |           |     |                 |  |
| SLAB ON GRADE HEAT LOSS        |  |           |       | 0         |                     |           | 0    |           |      | 0         |      |           | 0    |           |           | 0         |      |      | 0    |                                      |      |      |      | 0     |                     |           |     |                 |  |
| SUBTOTAL HT LOSS               |  |           |       |           | 2450                |           |      | 1711      |      |           | 3116 |           |      | 1235      |           |           | 2806 |      |      | 973                                  |      |      | 448  |       |                     | 739       |     |                 |  |
| SUB TOTAL HT GAIN              |  |           |       |           |                     | 1721      |      |           | 1040 |           |      | 3210      |      |           | 502       |           |      | 2617 |      |                                      | 569  |      |      | 256   |                     |           | 257 |                 |  |
| LEVEL FACTOR / MULTIPLIER      |  |           | 0.20  | 0.25      |                     |           | 0.20 | 0.25      |      | 0.20      | 0.25 |           | 0.20 | 0.25      |           | 0.20      | 0.25 |      | 0.20 | 0.25                                 |      | 0.20 | 0.25 |       | 0.20                | 0.25      |     |                 |  |
| AIR CHANGE HEAT LOSS           |  |           |       |           | 616                 |           |      | 430       |      |           | 783  |           |      | 310       |           |           | 705  |      |      | 245                                  |      |      | 112  |       |                     | 186       |     |                 |  |
| AIR CHANGE HEAT GAIN           |  |           |       |           |                     | 130       |      |           | 78   |           |      | 242       |      |           | 38        |           |      | 198  |      |                                      | 43   |      |      | 19    |                     |           | 19  |                 |  |
| DUCT LOSS                      |  |           |       | 0         |                     |           | 0    |           |      | 390       |      |           | 155  |           |           | 351       |      |      | 0    |                                      |      | 0    |      |       | 92                  |           |     |                 |  |
| DUCT GAIN                      |  |           |       | 0         |                     | 0         |      | 0         |      | 398       |      |           | 131  |           |           | 358       |      |      | 0    |                                      |      | 0    |      |       | 28                  |           |     |                 |  |
| HEAT GAIN PEOPLE               |  | 240       |       | 2         |                     | 480       | 0    |           | 0    | 0         |      | 1         |      | 240       | 1         |           | 240  | 1    |      | 240                                  | 0    |      | 0    |       | 0                   |           | 0   |                 |  |
| HEAT GAIN APPLIANCES/LIGHTS    |  |           |       |           |                     | 530       |      | 0         |      | 530       |      |           | 530  |           |           | 530       |      |      | 530  |                                      |      | 530  |      |       | 0                   |           | 0   |                 |  |
| TOTAL HT LOSS BTU/H            |  |           |       |           | 3066                |           |      | 2141      |      |           | 4288 |           |      | 1700      |           |           | 3862 |      |      | 1218                                 |      |      | 560  |       |                     | 1017      |     |                 |  |
| TOTAL HT GAIN x 1.3 BTU/H      |  |           |       |           |                     | 3719      |      |           | 1453 |           |      | 5695      |      |           | 1873      |           |      | 5126 |      |                                      | 1796 |      |      | 358   |                     |           | 396 |                 |  |

| ROOM USE                       | EXP. WALL |       | CLG. HT. |      | FAM  |     | L/D  |     | K/B  |      | L/H  |     | LND  |     | W/R  |     | FOY  |     |      |     |      |      |      |     |     |   | WOD  |   | BAS  |     |      |  |
|--------------------------------|-----------|-------|----------|------|------|-----|------|-----|------|------|------|-----|------|-----|------|-----|------|-----|------|-----|------|------|------|-----|-----|---|------|---|------|-----|------|--|
|                                | 34        |       | 10       |      | 34   |     | 24   |     | 37   |      | 18   |     | 8    |     | 26   |     | 42   |     |      |     |      |      |      |     |     |   | 46   |   | 176  |     |      |  |
|                                |           |       |          |      |      |     |      |     |      |      |      |     |      |     |      |     |      |     |      |     |      |      |      |     |     |   | 8    |   | 8    |     |      |  |
| GRS.WALL AREA                  | LOSS      | GAIN  |          |      |      |     |      |     |      |      |      |     |      |     |      |     |      |     |      |     |      |      |      |     |     |   |      |   |      |     |      |  |
| GLAZING                        | LOSS      | GAIN  |          |      |      |     |      |     |      |      |      |     |      |     |      |     |      |     |      |     |      |      |      |     |     |   |      |   |      |     |      |  |
| NORTH                          | 19.8      | 15.1  | 8        | 158  | 121  | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0    | 7   | 138  | 106 | 0    | 0   | 0    |      |      |     |     |   |      |   |      |     |      |  |
| EAST                           | 19.8      | 39.0  | 0        | 0    | 0    | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 6    | 119 | 234  |      |      |     |     |   |      |   |      |     |      |  |
| SOUTH                          | 19.8      | 23.5  | 0        | 0    | 0    | 33  | 662  | 776 | 0    | 0    | 0    | 12  | 237  | 282 | 7    | 138 | 164  | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 0   | 0 | 0    | 0 | 7    | 138 | 273  |  |
| WEST                           | 19.8      | 39.0  | 40       | 791  | 1561 | 0   | 0    | 0   | 60   | 1186 | 2341 | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 0   | 0 | 0    | 0 | 6    | 119 | 141  |  |
| SKYLT.                         | 34.6      | 101.5 | 0        | 0    | 0    | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 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   | 12   | 281  | 51   | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 20   | 468 | 85   | 40   | 938  | 170 |     |   |      |   |      |     |      |  |
| NET EXPOSED WALL               | 4.1       | 0.8   | 292      | 1211 | 219  | 207 | 858  | 156 | 298  | 1235 | 224  | 168 | 896  | 126 | 65   | 269 | 49   | 259 | 1074 | 195 | 374  | 1550 | 281  |     |     |   |      |   |      |     |      |  |
| 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    | 0    | 0    |     |     |   |      |   |      |     |      |  |
| EXPOSED CLG                    | 1.2       | 0.6   | 0        | 0    | 0    | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 120  | 143 | 71   | 0   | 0    | 0   | 0    | 0    | 0    |     |     |   |      |   |      |     |      |  |
| NO ATTIC EXPOSED CLG           | 2.6       | 1.3   | 0        | 0    | 0    | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 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   | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0    | 0    |     |     |   |      |   |      |     |      |  |
| BASEMENT/CRAWL HEAT LOSS       |           |       |          |      |      |     |      |     |      |      |      |     |      |     |      |     |      |     |      |     |      |      |      |     |     |   |      |   |      |     |      |  |
| SLAB ON GRADE HEAT LOSS        |           |       |          |      |      |     |      |     |      |      |      |     |      |     |      |     |      |     |      |     |      |      |      |     |     |   |      |   |      |     |      |  |
| SUBTOTAL HT LOSS               |           |       |          |      |      |     | 2159 |     |      |      | 1510 |     |      |     | 2703 |     |      |     | 934  |     |      |      | 551  |     |     |   | 1681 |   |      |     | 2607 |  |
| SUB TOTAL HT GAIN              |           |       |          |      | 1901 |     |      |     | 938  |      |      |     | 2616 |     |      |     | 408  |     |      |     | 284  |      |      |     | 386 |   |      |   | 685  |     |      |  |
| LEVEL FACTOR / MULTIPLIER      |           |       | 0.30     |      | 0.46 |     |      |     | 0.30 |      | 0.46 |     |      |     | 0.30 |     | 0.46 |     |      |     | 0.30 |      | 0.46 |     |     |   | 0.30 |   | 0.46 |     |      |  |
| AIR CHANGE HEAT LOSS           |           |       |          |      | 985  |     |      |     |      |      | 689  |     |      |     | 1232 |     |      |     | 425  |     |      |      | 138  |     |     |   | 767  |   |      |     | 1189 |  |
| AIR CHANGE HEAT GAIN           |           |       |          |      | 144  |     |      |     | 70   |      |      |     | 198  |     |      |     | 31   |     |      |     | 21   |      |      |     | 29  |   |      |   | 52   |     |      |  |
| DUCT LOSS                      |           |       | 0        |      |      |     |      |     | 0    |      |      |     | 0    |     |      |     | 0    |     |      |     | 0    |      |      |     | 0   |   |      |   | 0    |     |      |  |
| DUCT GAIN                      |           |       |          |      | 0    |     |      |     | 0    |      |      |     | 0    |     |      |     | 0    |     |      |     | 0    |      |      |     | 0   |   |      |   | 0    |     |      |  |
| HEAT GAIN PEOPLE               | 240       |       | 0        |      |      |     | 0    |     | 0    |      |      |     | 0    |     | 0    |     | 0    |     |      |     | 0    |      |      |     | 0   |   |      |   | 0    |     |      |  |
| HEAT GAIN APPLIANCES/LIGHTS    |           |       |          |      | 530  |     |      |     | 530  |      |      |     | 530  |     |      |     | 530  |     |      |     | 530  |      |      |     | 530 |   |      |   | 530  |     |      |  |
| TOTAL HT LOSS BTU/H            |           |       | 3144     |      |      |     | 2199 |     |      |      | 3935 |     |      |     | 1359 |     |      |     | 689  |     |      |      | 2448 |     |     |   | 3796 |   |      |     | 1120 |  |
| TOTAL HT GAIN x 1.3 BTU/H      |           |       |          |      | 3347 |     |      |     | 1989 |      |      |     | 4347 |     |      |     | 1259 |     |      |     | 1085 |      |      |     | 539 |   |      |   | 958  |     |      |  |

TOTAL HEAT GAIN BTU/H:

36875

TONS: 3.07

LOSS DUE TO VENTILATION LOAD BTU/H: 1515

STRUCTURAL HEAT LOSS: 63255

TOTAL COMBINED HEAT LOSS BTU/H: 54772

*Michael O'Rourke*

SITE NAME: RUSSEL GARDENS PHASE 3  
BUILDER: GREENPARK HOMES

TYPE: MOUNTAINASH 4

DATE: May-20

GFA: 3190 LO# 85967

HEATING CFM 1131 COOLING CFM 1131  
TOTAL HEAT LOSS 53,256 TOTAL HEAT GAIN 36,600  
AIR FLOW RATE CFM 21.24 AIR FLOW RATE CFM 30.9

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 r/a pressure 0.17  
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02  
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

#GOODMAN  
GMEC960603BNA 60  
FAN SPEED LOW  
MEDIUM 928  
MEDIUM HIGH 1017  
HIGH 1131

AFUE = 96 %  
INPUT (BTU/H) = 60,000  
OUTPUT (BTU/H) = 57,600  
DESIGN CFM = 1131  
CFM @ .5" E.S.P.

TEMPERATURE RISE 47 °F

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   | 21   | 22   | 23   | 24   |
|---------------------------|------|------|------|-------|-------|-------|-------|------|-------|------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| ROOM NAME                 | MBR  | ENS  | FLEX | BED-2 | BED-3 | BED-4 | ENS-3 | FLEX | BED-3 | MBR  | S-ENS | FAM  | L/D  | K/B  | K/B  | L/H  | LND  | W/R  | FOY  | BAS  | BAS  | BAS  | BAS  |
| RM LOSS MBH               | 1.53 | 2.14 | 2.14 | 1.70  | 1.93  | 1.22  | 0.56  | 2.14 | 1.93  | 1.53 | 0.51  | 3.14 | 2.20 | 1.97 | 1.97 | 1.36 | 0.69 | 2.45 | 3.80 | 4.46 | 4.46 | 4.46 | 4.46 |
| CFM PER RUN HEAT          | 33   | 45   | 46   | 36    | 41    | 26    | 12    | 46   | 41    | 33   | 11    | 67   | 47   | 42   | 42   | 29   | 15   | 52   | 81   | 95   | 95   | 95   | 95   |
| RM GAIN MBH               | 1.86 | 1.45 | 2.85 | 1.87  | 2.56  | 1.80  | 0.36  | 2.85 | 2.56  | 1.86 | 0.20  | 3.35 | 1.99 | 2.17 | 2.17 | 1.26 | 1.09 | 0.54 | 0.96 | 0.66 | 0.66 | 0.66 | 0.66 |
| CFM PER RUN COOLING       | 57   | 45   | 88   | 58    | 79    | 56    | 11    | 88   | 79    | 57   | 6     | 103  | 61   | 67   | 67   | 39   | 34   | 17   | 30   | 21   | 21   | 21   | 21   |
| ADJUSTED PRESSURE         | 0.17 | 0.17 | 0.16 | 0.17  | 0.17  | 0.17  | 0.17  | 0.16 | 0.17  | 0.17 | 0.17  | 0.16 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| ACTUAL DUCT LGH           | 32   | 63   | 51   | 56    | 61    | 46    | 49    | 58   | 49    | 38   | 46    | 26   | 25   | 38   | 44   | 40   | 23   | 47   | 48   | 34   | 20   | 24   | 41   |
| EQUIVALENT LENGTH         | 130  | 150  | 180  | 140   | 100   | 210   | 200   | 130  | 190   | 100  | 130   | 130  | 140  | 120  | 120  | 140  | 160  | 130  | 110  | 120  | 100  | 130  | 130  |
| TOTAL EFFECTIVE LENGTH    | 162  | 213  | 211  | 196   | 161   | 256   | 249   | 188  | 239   | 138  | 176   | 156  | 165  | 158  | 164  | 180  | 183  | 177  | 158  | 154  | 120  | 154  | 171  |
| ADJUSTED PRESSURE         | 0.11 | 0.08 | 0.08 | 0.09  | 0.11  | 0.07  | 0.07  | 0.09 | 0.07  | 0.12 | 0.1   | 0.1  | 0.1  | 0.11 | 0.1  | 0.1  | 0.09 | 0.1  | 0.1  | 0.11 | 0.14 | 0.11 | 0.09 |
| ROUND DUCT SIZE           | 5    | 5    | 6    | 5     | 6     | 5     | 4     | 6    | 5     | 5    | 4     | 6    | 5    | 5    | 5    | 4    | 4    | 5    | 5    | 6    | 6    | 6    | 6    |
| HEATING VELOCITY (ft/min) | 242  | 330  | 235  | 264   | 209   | 191   | 138   | 235  | 209   | 242  | 126   | 342  | 345  | 308  | 308  | 333  | 172  | 382  | 595  | 484  | 484  | 484  | 484  |
| COOLING VELOCITY (ft/min) | 419  | 330  | 449  | 426   | 403   | 411   | 126   | 449  | 403   | 419  | 69    | 525  | 448  | 492  | 447  | 390  | 125  | 220  | 107  | 107  | 107  | 107  | 107  |
| OUTLET GRILL SIZE         | 3X10 | 3X10 | 4X10 | 3X10  | 4X10  | 3X10  | 3X10  | 4X10 | 4X10  | 3X10 | 3X10  | 4X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 4X10 | 4X10 | 4X10 | 4X10 |
| TRUNK                     | C    | A    | D    | A     | E     | D     | D     | D    | D     | C    | E     | C    | E    | B    | B    | D    | C    | A    | D    | B    | C    | E    | D    |

|                           |       |
|---------------------------|-------|
| RUN #                     | 25    |
| ROOM NAME                 | S-ENS |
| RM LOSS MBH               | 0.51  |
| CFM PER RUN HEAT          | 11    |
| RM GAIN MBH               | 0.20  |
| CFM PER RUN COOLING       | 6     |
| ADJUSTED PRESSURE         | 0.17  |
| ACTUAL DUCT LGH           | 46    |
| EQUIVALENT LENGTH         | 140   |
| TOTAL EFFECTIVE LENGTH    | 186   |
| ADJUSTED PRESSURE         | 0.09  |
| ROUND DUCT SIZE           | 4     |
| HEATING VELOCITY (ft/min) | 126   |
| COOLING VELOCITY (ft/min) | 69    |
| OUTLET GRILL SIZE         | 3X10  |
| TRUNK                     | E     |

## SUPPLY AIR TRUNK SIZE

| TRUNK   | CFM | STATIC PRESS. | ROUND DUCT | RECT DUCT | VELOCITY (ft/min) |
|---------|-----|---------------|------------|-----------|-------------------|
| TRUNK A | 133 | 0.08          | 6.6        | 8         | 299               |
| TRUNK B | 179 | 0.10          | 7          | 8         | 403               |
| TRUNK C | 555 | 0.08          | 11.2       | 14        | 714               |
| TRUNK D | 376 | 0.07          | 10.1       | 12        | 584               |
| TRUNK E | 581 | 0.07          | 11.8       | 16        | 654               |
| TRUNK F | 0   | 0.00          | 0          | 0         | 0                 |

## RETURN AIR TRUNK SIZE

| TRUNK   | CFM  | STATIC PRESS. | ROUND DUCT | RECT DUCT | VELOCITY (ft/min) |
|---------|------|---------------|------------|-----------|-------------------|
| TRUNK G | 0    | 0.00          | 0          | 0         | 0                 |
| TRUNK H | 0    | 0.00          | 0          | 0         | 0                 |
| TRUNK I | 0    | 0.00          | 0          | 0         | 0                 |
| TRUNK J | 0    | 0.00          | 0          | 0         | 0                 |
| TRUNK K | 0    | 0.00          | 0          | 0         | 0                 |
| TRUNK L | 0    | 0.00          | 0          | 0         | 0                 |
| TRUNK O | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK P | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK Q | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK R | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK S | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK T | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK U | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK V | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK W | 0    | 0.05          | 0          | 0         | 8                 |
| TRUNK X | 876  | 0.05          | 15         | 26        | 8                 |
| TRUNK Y | 535  | 0.05          | 12.5       | 18        | 8                 |
| TRUNK Z | 0    | 0.05          | 0          | 0         | 8                 |
| DROP    | 1131 | 0.05          | 16.5       | 24        | 10                |

| RETURN AIR #       | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19    | 21   | 22   | 23   | 24   |
|--------------------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|
| AIR VOLUME         | 85   | 95   | 95   | 85   | 75   | 360  | 175  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 161  | 161  | 161  | 161  |
| 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 | 0.15 | 0.15 | 0.15 |
| ACTUAL DUCT LGH    | 51   | 42   | 51   | 53   | 63   | 26   | 26   | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 15   | 15   | 15   | 15   |
| EQUIVALENT LENGTH  | 205  | 165  | 155  | 205  | 210  | 185  | 190  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 185  | 185  | 185  | 185  |
| TOTAL EFFECTIVE LH | 256  | 207  | 206  | 258  | 273  | 211  | 216  | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 200  | 200  | 200  | 200  |
| ADJUSTED PRESSURE  | 0.06 | 0.07 | 0.07 | 0.06 | 0.05 | 0.07 | 0.07 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 0.07 | 0.07 | 0.07 | 0.07 |
| ROUND DUCT SIZE    | 6    | 6    | 6    | 6    | 6    | 9.9  | 7.5  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 7.3  | 7.3  | 7.3  | 7.3  |
| INLET GRILL SIZE   | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 8    | 8    | 8    | 8    |
| INLET GRILL SIZE   | 14   | 14   | 14   | 14   | 14   | 30   | 14   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 14   | 14   | 14   | 14   |

TYPE: MOUNTAINASH 4  
SITE NAME: RUSSEL GARDENS PHASE 3

LO # 85967

**RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY**

| COMBUSTION APPLIANCES |                                                                               | 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                             |             |

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

| HOUSE TYPE                            |                                                      | 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                |           |

| SYSTEM DESIGN OPTIONS                 |                                               | 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                                 |            |

| TOTAL VENTILATION CAPACITY |              | 9.32.3.3(1) |
|----------------------------|--------------|-------------|
| Basement + Master Bedroom  | 2 @ 21.2 cfm | 42.4 cfm    |
| Other Bedrooms             | 3 @ 10.6 cfm | 31.8 cfm    |
| Kitchen & Bathrooms        | 5 @ 10.6 cfm | 53 cfm      |
| Other Rooms                | 8 @ 10.6 cfm | 84.8 cfm    |
| Table 9.32.3.A.            | TOTAL        | 212.0 cfm   |

| PRINCIPAL VENTILATION CAPACITY REQUIRED |      | 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                                   | 79.5 | cfm          |

| SUPPLEMENTAL VENTILATION CAPACITY |       | 9.32.3.5. |
|-----------------------------------|-------|-----------|
| Total Ventilation Capacity        | 212   | cfm       |
| Less Principal Ventil. Capacity   | 79.5  | cfm       |
| Required Supplemental Capacity    | 132.5 | cfm       |

| PRINCIPAL EXHAUST FAN CAPACITY                   |                |
|--------------------------------------------------|----------------|
| Model: VANEE 65H                                 | Location: BSMT |
| 79.5 cfm                                         | 3.0 sones      |
| <input checked="" type="checkbox"/> HVI Approved |                |

| PRINCIPAL EXHAUST HEAT LOSS CALCULATION |               |        |        |      |
|-----------------------------------------|---------------|--------|--------|------|
| CFM                                     | $\Delta T$ °F | FACTOR | % LOSS |      |
| 79.5 CFM                                | X 71 F        | X 1.08 | X      | 0.25 |

| SUPPLEMENTAL FANS |             | PANASONIC |                                     |       |
|-------------------|-------------|-----------|-------------------------------------|-------|
| Location          | Model       | cfm       | HVI                                 | Sones |
| ENS               | FV-05-11VK1 | 50        | <input checked="" type="checkbox"/> | 0.3   |
| ENS-3             | FV-05-11VK1 | 50        | <input checked="" type="checkbox"/> | 0.3   |
| S-ENS             | FV-05-11VK1 | 50        | <input checked="" type="checkbox"/> | 0.3   |
| W/R               | FV-05-11VK1 | 50        | <input checked="" type="checkbox"/> | 0.3   |

| HEAT RECOVERY VENTILATOR |                                                  | 9.32.3.11. |
|--------------------------|--------------------------------------------------|------------|
| Model: VANEE 65H         |                                                  |            |
| 155 cfm high             | 64 cfm low                                       |            |
| 75 % Sensible Efficiency | <input checked="" type="checkbox"/> HVI Approved |            |
| @ 32 deg F ( 0 deg C)    |                                                  |            |

| LOCATION OF INSTALLATION |                   |
|--------------------------|-------------------|
| Lot:                     | Concession        |
| Township                 | Plan:             |
| Address                  |                   |
| Roll #                   | Building Permit # |

| BUILDER: GREENPARK HOMES |        |
|--------------------------|--------|
| Name:                    |        |
| Address:                 |        |
| City:                    |        |
| Telephone #:             | Fax #: |

| INSTALLING CONTRACTOR |        |
|-----------------------|--------|
| Name:                 |        |
| Address:              |        |
| City:                 |        |
| Telephone #:          | Fax #: |

| DESIGNER CERTIFICATION                                                                                        |                         |
|---------------------------------------------------------------------------------------------------------------|-------------------------|
| 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:                                                                                                         | May-20                  |

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.  
INDIVIDUAL BCIN: 19869 *Michael O'Rourke* MICHAEL O'ROURKE

**CSA F280-12 Residential Heat Loss and Heat Gain Calculations**
**Formula Sheet (For Air Leakage / Ventilation Calculation)**

LO#: 85967

Model: MOUNTAINASH 4

Builder: GREENPARK HOMES

Date: 05/05/2020

**Volume Calculation**
**Air Change & Delta T Data**
**House Volume**

| Level  | Floor Area (ft <sup>2</sup> ) | Floor Height (ft) | Volume (ft <sup>3</sup> ) |
|--------|-------------------------------|-------------------|---------------------------|
| Bsmt   | 1398                          | 8                 | 11184                     |
| First  | 1398                          | 10                | 13980                     |
| Second | 1792                          | 9                 | 16128                     |
| Third  | 0                             | 9                 | 0                         |
| Fourth | 0                             | 9                 | 0                         |
| Total: |                               |                   | 41,292.0 ft <sup>3</sup>  |
| Total: |                               |                   | 1169.3 m <sup>3</sup>     |

|                                |       |
|--------------------------------|-------|
| WINTER NATURAL AIR CHANGE RATE | 0.338 |
| SUMMER NATURAL AIR CHANGE RATE | 0.121 |

**Design Temperature Difference**

|             | T <sub>in</sub> °C | T <sub>out</sub> °C | ΔT °C | ΔT °F |
|-------------|--------------------|---------------------|-------|-------|
| Winter DTDh | 22                 | -17                 | 39    | 71    |
| Summer DTDc | 24                 | 31                  | 7     | 13    |

**5.2.3.1 Heat Loss due to Air Leakage**
**6.2.6 Sensible Gain due to Air Leakage**

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

$$0.338 \times 324.79 \times 39^\circ\text{C} \times 1.2 = 5165 \text{ W}$$

$$= 17622 \text{ Btu/h}$$

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

$$= 0.121 \times 324.79 \times 7^\circ\text{C} \times 1.2 = 335 \text{ W}$$

$$= 1144 \text{ Btu/h}$$

**5.2.3.2 Heat Loss due to Mechanical Ventilation**
**6.2.7 Sensible heat Gain due to Ventilation**

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

$$80 \text{ CFM} \times 71^\circ\text{F} \times 1.08 \times 0.25 = 1515 \text{ Btu/h}$$

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

$$80 \text{ CFM} \times 13^\circ\text{F} \times 1.08 \times 0.25 = 275 \text{ Btu/h}$$

**5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)**

$$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agcleve} + HL_{bgcleve})\}$$

| Level | Level Factor (LF) | HL <sub>airbv</sub> Air Leakage + Ventilation Heat Loss (Btu/h) | Level Conductive Heat Loss: (HL <sub>cleve</sub> ) | Air Leakage Heat Loss Multiplier (LF x HL <sub>airbv</sub> / HL <sub>cleve</sub> ) |
|-------|-------------------|-----------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------|
| 1     | 0.5               | 17,622                                                          | 9,022                                              | 0.977                                                                              |
| 2     | 0.3               |                                                                 | 11,595                                             | 0.456                                                                              |
| 3     | 0.2               |                                                                 | 14,029                                             | 0.251                                                                              |
| 4     | 0                 |                                                                 | 0                                                  | 0.000                                                                              |
| 5     | 0                 |                                                                 | 0                                                  | 0.000                                                                              |

\*HL<sub>airbv</sub> = Air leakage heat loss + ventilation heat loss

\*For a balanced or supply only ventilation system HL<sub>airve</sub> = 0

**HEAT LOSS AND GAIN SUMMARY SHEET****MODEL:** MOUNTAINASH 4**SFQT:** 3190**LO#** 85967**BUILDER:** GREENPARK HOMES**SITE:** RUSSEL GARDENS PHASE 3**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):                 | 41292.0         | ASSUMED (Y/N):            | Y        |
| INTERNAL SHADING:                   | BLINDS/CURTAINS | ASSUMED OCCUPANTS:        | 5        |
| INTERIOR LIGHTING LOAD (Btu/h/ft²): | 1.27            | DC BRUSHLESS MOTOR (Y/N): | Y        |
| FOUNDATION CONFIGURATION            | BCIN_1          | DEPTH BELOW GRADE:        | 5.0 ft   |
| LENGTH: 52.0 ft                     | WIDTH: 36.0 ft  | EXPOSED PERIMETER:        | 176.0 ft |

**2012 OBC - COMPLIANCE PACKAGE**

| Component                                                                  | Compliance Package 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                                       | 0.96                  | -         |
| HRV Minimum Efficiency                                                     | 75%                   | -         |
| Domestic Hot Water Heater Minimum EF                                       | 0.8                   | -         |

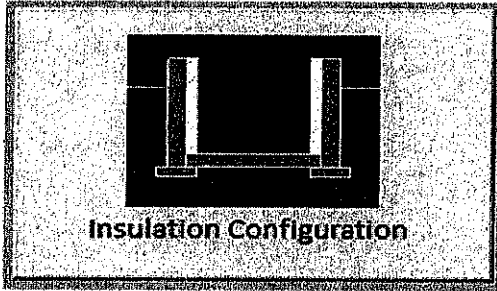
INDIVIDUAL BCIN: 19669

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):              | 15.8                                      | <br>Insulation Configuration |
| Floor Width (m):               | 11.0                                      |                                                                                                                 |
| Exposed Perimeter (m):         | 0.0                                       |                                                                                                                 |
| Wall Height (m):               | 2.4                                       |                                                                                                                 |
| Depth Below Grade (m):         | 1.52                                      |                                                                                                                 |
| Window Area (m <sup>2</sup> ): | 2.6                                       |                                                                                                                 |
| 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):          |                                           | 1703                                                                                                            |

TYPE: MOUNTAINASH 4  
LO# 85967

## 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):       | 7.62                       |                        |    |    |
| Building Configuration            |                            |                        |    |    |
| Type:                             | Detached                   |                        |    |    |
| Number of Stories:                | Two                        |                        |    |    |
| Foundation:                       | Full                       |                        |    |    |
| House Volume (m <sup>3</sup> ):   | 1169.3                     |                        |    |    |
| Air Leakage/Ventilation           |                            |                        |    |    |
| Air Tightness Type:               | Present (1961-) (3.57 ACH) |                        |    |    |
| Custom BDT Data:                  | ELA @ 10 Pa.               | 1558.7 cm <sup>2</sup> |    |    |
|                                   | 3.57                       | ACH @ 50 Pa            |    |    |
| Mechanical Ventilation (L/s):     | Total Supply               | Total Exhaust          |    |    |
|                                   | 37.5                       | 37.5                   |    |    |
| Flue Size                         |                            |                        |    |    |
| Flue #:                           | #1                         | #2                     | #3 | #4 |
| Diameter (mm):                    | 0                          | 0                      | 0  | 0  |
| Natural Infiltration Rates        |                            |                        |    |    |
| Heating Air Leakage Rate (ACH/H): | 0.338                      |                        |    |    |
| Cooling Air Leakage Rate (ACH/H): | 0.121                      |                        |    |    |

TYPE: MOUNTAINASH 4  
LO# 85967

PARTIAL BASEMENT PLAN  
DECK CONDITION

COLD  
STORAGE

BASEMENT PLAN - ELEV. '3'

UNFINISHED  
BASEMENT

UNEXCAVATED

BASEMENT PLAN - ELEV. '1'

BASEMENT PLAN - ELEV. '2'

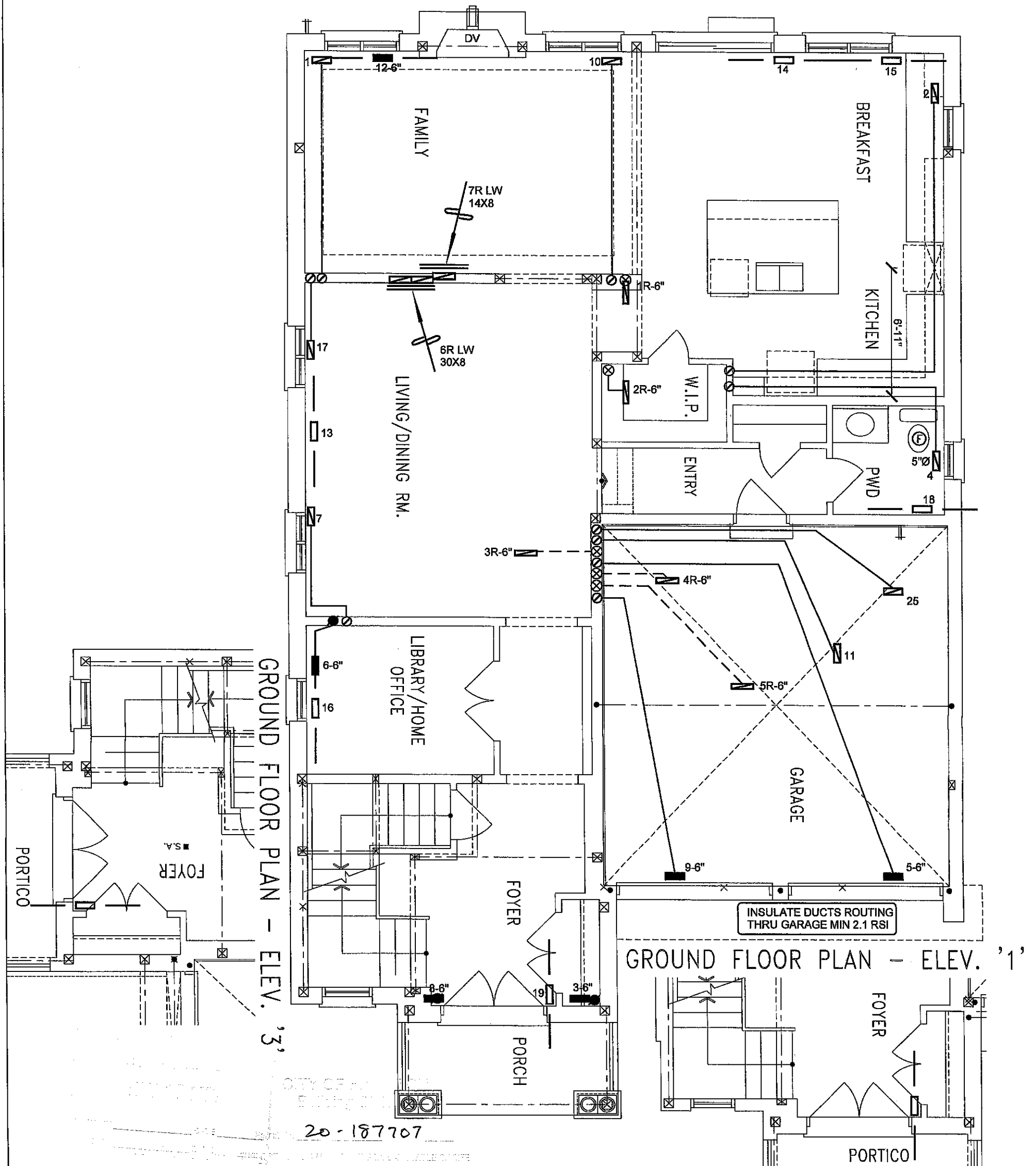
CSA-F280-12  
PACKAGE A1

I MICHAEL O'Rourke HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.32.3 OF THE BUILDING CODE.  
*Michael O'Rourke*  
Michael O'Rourke, BCIN# 19669  
HVAC DESIGNS LTD.

| HVAC LEGEND |                           |        |                                 |        |                              | 3.     |                            |
|-------------|---------------------------|--------|---------------------------------|--------|------------------------------|--------|----------------------------|
| SYMBOL      | DESCRIPTION               | SYMBOL | DESCRIPTION                     | SYMBOL | DESCRIPTION                  | SYMBOL | DESCRIPTION                |
|             | SUPPLY AIR GRILLE         |        | 6" SUPPLY AIR BOOT ABOVE        |        | 14"x8" RETURN AIR GRILLE     |        | RETURN AIR STACK ABOVE     |
|             | SUPPLY AIR GRILLE 6" BOOT |        | SUPPLY AIR STACK FROM 2nd FLOOR |        | 30"x8" RETURN AIR GRILLE     |        | RETURN AIR STACK 2nd FLOOR |
|             | SUPPLY AIR BOOT ABOVE     |        | 6" SUPPLY AIR STACK 2nd FLOOR   |        | FRA- FLOOR RETURN AIR GRILLE |        | REDUCER                    |
|             |                           |        |                                 |        |                              |        | REVISIONS                  |
| No.         | Description               |        |                                 |        |                              |        | Date                       |

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|                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                          |                                                                                                                                                                                                                                              |                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Client<br><b>GREENPARK HOMES</b><br><br>Project Name<br><b>RUSSEL GARDENS PHASE 3<br/>HAMILTON, ONTARIO</b><br><br><b>MOUNTAINASH 4 3190 sqft</b> | <b>HVAC DESIGNS LTD.</b><br>375 Finley Ave. Suite 202 - Ajax, Ontario<br>L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375<br>Email: info@hvacdsgns.ca<br>Web: www.hvacdsgns.ca<br>Specializing in Residential Mechanical Design Services<br>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. | HEAT LOSS 54772 BTU/H<br>UNIT DATA<br>MAKE GOODMAN<br>MODEL GMEC980603BNA<br>INPUT 60 MBTU/H<br>OUTPUT 57.6 MBTU/H<br>COOLING 3.0 TONS<br>FAN SPEED 1131 cfm @ 0.6" w.c. | # OF RUNS S/A R/A FANS<br>3RD FLOOR<br>2ND FLOOR 13 5 3<br>1ST FLOOR 7 2 2<br>BASEMENT 4 1 0<br>ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5" UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A | Sheet Title<br><b>BASEMENT<br/>HEATING<br/>LAYOUT</b><br>Date <b>APRIL/2020</b><br>Scale <b>3/16" = 1'-0"</b><br>BCIN# 19669<br>LO# <b>85967</b> |
|                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                          |                                                                                                                                                                                                                                              |                                                                                                                                                  |



1 MICHAEL O'Rourke HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.3.2.3 OF THE BUILDING CODE.  
*Michael O'Rourke*  
Michael O'Rourke, BCINP 19669  
HVAC DESIGNS LTD.

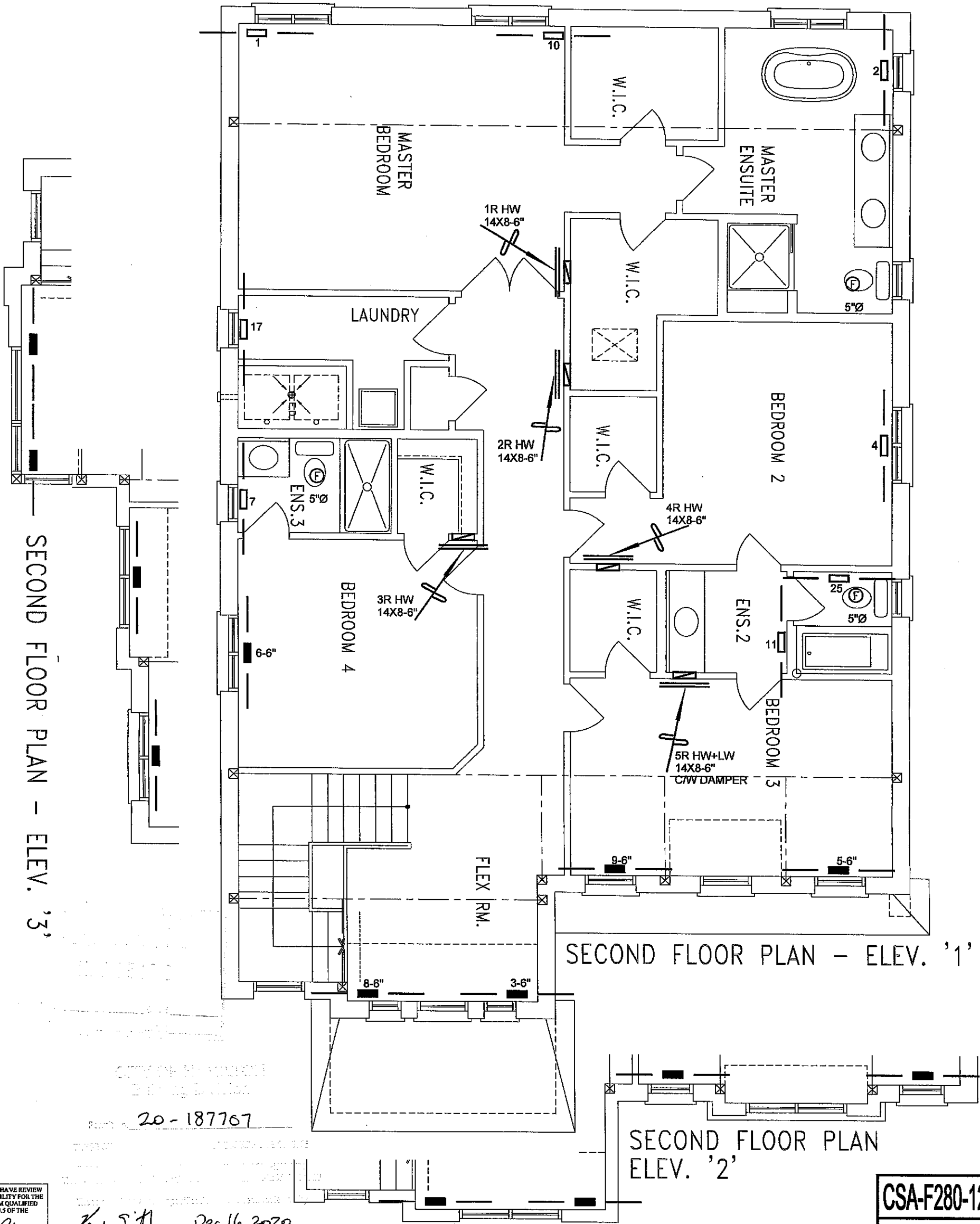
*Ken Smith* Dec 16, 2020  
PROJECT NO. 20-187707

GROUND FLOOR PLAN - ELEV. '2'  
**CSA-F280-12**  
**PACKAGE A1**

| HVAC LEGEND |                           |  |                                 |  |                              |           |             |
|-------------|---------------------------|--|---------------------------------|--|------------------------------|-----------|-------------|
|             | SUPPLY AIR GRILLE         |  | 6" SUPPLY AIR BOOT ABOVE        |  | 14"x8" RETURN AIR GRILLE     | 3.        |             |
|             | SUPPLY AIR GRILLE 6" BOOT |  | SUPPLY AIR STACK FROM 2nd FLOOR |  | 30"x8" RETURN AIR GRILLE     | 2.        |             |
|             | SUPPLY AIR BOOT ABOVE     |  | 6" SUPPLY AIR STACK 2nd FLOOR   |  | RETURN AIR STACK ABOVE       | 1.        |             |
|             |                           |  |                                 |  | RETURN AIR STACK 2nd FLOOR   | No.       | Description |
|             |                           |  |                                 |  | FRA- FLOOR RETURN AIR GRILLE |           | Date        |
|             |                           |  |                                 |  | REDUCER                      | REVISIONS |             |

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|                                                                     |  |                                                                                                                                                                                                                                                                                                                   |                                                          |              |
|---------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------|
| Client<br><b>GREENPARK HOMES</b>                                    |  | <br>375 Finley Ave. Suite 202 - Ajax, Ontario<br>L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375<br>Email: info@hvacdesigns.ca<br>Web: www.hvacdesigns.ca<br>Specializing in Residential Mechanical Design Services | Sheet Title<br><b>FIRST FLOOR<br/>HEATING<br/>LAYOUT</b> |              |
| Project Name<br><b>RUSSEL GARDENS PHASE 3<br/>HAMILTON, ONTARIO</b> |  |                                                                                                                                                                                                                                                                                                                   | Date<br><b>APRIL/2020</b>                                |              |
| <b>MOUNTAINASH 4 3190 sqft</b>                                      |  | 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.                                                           | Scale<br><b>3/16" = 1'-0"</b>                            |              |
|                                                                     |  |                                                                                                                                                                                                                                                                                                                   | BCIN# 19669                                              |              |
|                                                                     |  |                                                                                                                                                                                                                                                                                                                   | <b>LO#</b>                                               | <b>85967</b> |



I MICHAEL O'Rourke HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

*Michael O'Rourke*  
Michael O'Rourke, BCIN# 19669  
HVAC DESIGNS LTD.

*Ken Smith* Dec 16, 2020

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

| HVAC LEGEND |                           |        |                                 |        |                               |        | 3.                         |             |      |
|-------------|---------------------------|--------|---------------------------------|--------|-------------------------------|--------|----------------------------|-------------|------|
| SYMBOL      | DESCRIPTION               | SYMBOL | DESCRIPTION                     | SYMBOL | DESCRIPTION                   | SYMBOL | DESCRIPTION                | 2.          |      |
|             | SUPPLY AIR GRILLE         |        | 6" SUPPLY AIR BOOT ABOVE        |        | 14"x8" RETURN AIR GRILLE      |        | RETURN AIR STACK ABOVE     | 1.          |      |
|             | SUPPLY AIR GRILLE 6" BOOT |        | SUPPLY AIR STACK FROM 2nd FLOOR |        | 30"x8" RETURN AIR GRILLE      |        | RETURN AIR STACK 2nd FLOOR | No.         |      |
|             | SUPPLY AIR BOOT ABOVE     |        | 6" SUPPLY AIR STACK 2nd FLOOR   |        | FRA - FLOOR RETURN AIR GRILLE |        | REDUCER                    | Description | Date |
|             |                           |        |                                 |        |                               |        | REVISIONS                  |             |      |

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|                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                   |              |
|-----------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------|
| Client<br><b>GREENPARK HOMES</b>                                |  | <div><b>HVACDESIGNS LTD.</b></div> <div>375 Finley Ave. Suite 202 - Ajax, Ontario<br/>L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375<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>SECOND FLOOR HEATING LAYOUT</b> |              |
| Project Name<br><b>RUSSEL GARDENS PHASE 3 HAMILTON, ONTARIO</b> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Date <b>APRIL/2020</b>                            |              |
| <b>MOUNTAINASH 4   3190 sqft</b>                                |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Scale <b>3/16" = 1'-0"</b>                        |              |
|                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>BCIN# 19669</b>                                |              |
|                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>LO#</b>                                        | <b>85967</b> |