

| ROOM USE                       |      | LVD/IN |      | K/B  |      | FAM  |      | LND  |      | FOY  |      | WOD  |      | BAS  |      |      |       |
|--------------------------------|------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| EXP. WALL                      |      | 40     |      | 36   |      | 45   |      | 27   |      | 25   |      | 46   |      | 172  |      |      |       |
| CLG. HT.                       |      | 11     |      | 11   |      | 11   |      | 12   |      | 11   |      | 9    |      | 9    |      |      |       |
| FACTORS                        |      | 440    |      | 396  |      | 495  |      | 324  |      | 275  |      | 414  |      | 1170 |      |      |       |
| GRS.WALL AREA                  | LOSS | GAIN   | LOSS | GAIN | LOSS | GAIN | LOSS | GAIN | LOSS | GAIN | LOSS | GAIN | LOSS | GAIN | LOSS | GAIN |       |
| GLAZING                        |      |        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |
| NORTH                          | 19.8 | 16.0   | 0    | 0    | 0    | 0    | 0    | 0    | 8    | 158  | 128  | 0    | 0    | 0    | 5    | 99   | 80    |
| EAST                           | 19.8 | 41.5   | 14   | 277  | 582  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0     |
| SOUTH                          | 19.8 | 24.9   | 34   | 672  | 847  | 0    | 0    | 0    | 0    | 0    | 0    | 5    | 99   | 124  | 5    | 99   | 124   |
| WEST                           | 19.8 | 41.6   | 0    | 0    | 0    | 70   | 1384 | 2909 | 40   | 791  | 1652 | 0    | 0    | 0    | 0    | 0    | 0     |
| SKYL.T.                        | 34.6 | 101.5  | 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    | 20   | 469  | 85   | 0    | 0    | 20   | 469  | 85    |
| NET EXPOSED WALL               | 4.1  | 0.8    | 392  | 1625 | 295  | 325  | 1351 | 245  | 455  | 1886 | 342  | 296  | 1227 | 222  | 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     |
| EXPOSED CLG                    | 1.2  | 0.6    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 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    | 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     |
| BASEMENT/CRAWL HEAT LOSS       |      |        | 0    |      |      | 0    |      |      | 0    |      |      | 0    |      |      |      |      |       |
| SLAB ON GRADE HEAT LOSS        |      |        | 0    |      |      | 0    |      |      | 0    |      |      | 0    |      |      |      |      |       |
| SUBTOTAL HT LOSS               |      |        | 2574 |      |      | 2735 |      |      | 2677 |      |      | 1854 |      |      |      |      |       |
| SUB TOTAL HT GAIN              |      |        |      |      |      | 3154 |      |      | 2004 |      |      | 435  |      |      |      |      |       |
| LEVEL FACTOR / MULTIPLIER      | 0.30 | 0.44   |      |      | 0.30 | 0.44 |      |      | 0.30 | 0.44 |      |      |      |      | 0.50 | 1.01 |       |
| AIR CHANGE HEAT LOSS           |      |        | 1139 |      |      | 1211 |      |      |      |      | 521  |      |      |      |      |      | 8741  |
| AIR CHANGE HEAT GAIN           |      |        |      | 129  |      | 236  |      |      |      |      | 160  |      | 33   |      |      |      | 60    |
| DUCT LOSS                      |      |        | 0    |      |      | 0    |      |      |      |      | 0    |      |      |      |      |      | 0     |
| DUCT GAIN                      |      |        | 0    |      |      | 0    |      |      |      |      | 0    |      |      |      |      |      | 0     |
| HEAT GAIN PEOPLE               | 240  |        | 0    |      |      | 0    |      |      | 0    |      | 0    |      |      |      | 0    |      | 0     |
| HEAT GAIN APPLIANCES/LIGHTS    |      |        |      | 585  |      | 585  |      |      | 585  |      | 585  |      |      |      |      |      | 585   |
| TOTAL HT LOSS BTU/H            |      |        | 3713 |      |      | 3946 |      |      | 3862 |      | 2675 |      |      |      |      |      | 16350 |
| TOTAL HT GAIN x 1.3 BTU/H      |      |        | 3168 |      |      | 6167 |      |      | 3660 |      | 1368 |      |      |      |      |      | 4513  |

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DEC 17 2020

CITY OF TAMPA FLORIDA  
Planning & Development Department

**TOTAL COMBINED HEAT LOSS BTU/H: 52321**

SITE NAME: RUSSEL GARDENS PHASE 3  
BUILDER: GREENPARK HOMES

LOT 100  
TYPE: MOUNTAINASH 2

DATE: Aug-20

GFA: 2847 LO# 87257

HEATING CFM 1131 COOLING CFM 1131  
TOTAL HEAT LOSS 50,805 TOTAL HEAT GAIN 35,448  
AIR FLOW RATE CFM 22.26 AIR FLOW RATE CFM 31.91

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

#GOODMAN  
GMEC960603BNA 60  
FAN SPEED LOW  
MEDLOW  
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.

| RUN COUNT | 4th | 3rd | 2nd | 1st | Bas |
|-----------|-----|-----|-----|-----|-----|
| S/A       | 0   | 0   | 11  | 6   | 4   |
| R/A       | 0   | 0   | 5   | 2   | 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     | 14   | 15   | 16   | 17   | 19   | 21   | 22   | 23   | 24   |
|---------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|--------|------|------|------|------|------|------|------|------|------|
| ROOM NAME                 | MBR  | ENS  | BED-3 | BED-2 | BED-3 | BED-4 | ENS-2 | BED-4 | ENS-3 | MBR  | ENS-3 | LV/DIN | K/B  | K/B  | FAM  | LND  | FOY  | BAS  | BAS  | BAS  | BAS  |
| RM LOSS MBH               | 1.78 | 1.73 | 1.02  | 1.28  | 1.02  | 2.49  | 0.74  | 2.49  | 1.02  | 1.78 | 1.02  | 3.71   | 1.97 | 1.97 | 3.86 | 2.68 | 2.89 | 4.34 | 4.34 | 4.34 | 4.34 |
| CFM PER RUN HEAT          | 40   | 38   | 23    | 29    | 23    | 55    | 17    | 55    | 23    | 40   | 23    | 83     | 44   | 44   | 86   | 60   | 64   | 97   | 97   | 97   | 97   |
| RM GAIN MBH               | 2.19 | 1.27 | 1.91  | 1.72  | 1.91  | 3.04  | 0.41  | 3.04  | 0.90  | 2.19 | 0.90  | 3.17   | 2.58 | 2.58 | 3.56 | 1.37 | 0.83 | 0.47 | 0.47 | 0.47 | 0.47 |
| CFM PER RUN COOLING       | 70   | 41   | 61    | 55    | 61    | 97    | 13    | 97    | 29    | 70   | 29    | 101    | 82   | 82   | 114  | 44   | 26   | 15   | 15   | 15   | 15   |
| ADJUSTED PRESSURE         | 0.17 | 0.17 | 0.17  | 0.17  | 0.17  | 0.16  | 0.17  | 0.16  | 0.17  | 0.17 | 0.17  | 0.16   | 0.16 | 0.16 | 0.15 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 |
| ACTUAL DUCT LGH.          | 31   | 55   | 55    | 44    | 48    | 64    | 45    | 60    | 48    | 43   | 60    | 40     | 28   | 38   | 17   | 40   | 43   | 30   | 10   | 34   | 47   |
| EQUIVALENT LENGTH         | 150  | 130  | 130   | 130   | 120   | 170   | 130   | 180   | 170   | 200  | 160   | 140    | 140  | 110  | 110  | 90   | 100  | 130  | 80   | 130  | 110  |
| TOTAL EFFECTIVE LENGTH    | 181  | 185  | 185   | 174   | 168   | 234   | 175   | 240   | 218   | 243  | 220   | 180    | 168  | 148  | 127  | 130  | 143  | 160  | 90   | 164  | 157  |
| ADJUSTED PRESSURE         | 0.1  | 0.09 | 0.09  | 0.1   | 0.1   | 0.07  | 0.1   | 0.07  | 0.08  | 0.07 | 0.08  | 0.09   | 0.1  | 0.11 | 0.12 | 0.13 | 0.12 | 0.1  | 0.18 | 0.1  | 0.1  |
| ROUND DUCT SIZE           | 6    | 4    | 5     | 5     | 5     | 6     | 4     | 6     | 4     | 6    | 4     | 6      | 6    | 6    | 6    | 6    | 6    | 6    | 6    | 6    | 6    |
| HEATING VELOCITY (ft/min) | 204  | 436  | 169   | 213   | 169   | 280   | 195   | 280   | 264   | 204  | 264   | 423    | 224  | 224  | 438  | 306  | 470  | 495  | 495  | 495  | 495  |
| COOLING VELOCITY (ft/min) | 357  | 470  | 448   | 404   | 448   | 495   | 149   | 495   | 333   | 357  | 333   | 515    | 418  | 418  | 581  | 224  | 191  | 76   | 76   | 76   | 76   |
| OUTLET GRILL SIZE         | 4X10 | 3X10 | 3X10  | 3X10  | 3X10  | 4X10  | 3X10  | 4X10  | 3X10  | 4X10 | 3X10  | 4X10   | 4X10 | 4X10 | 4X10 | 4X10 | 3X10 | 4X10 | 4X10 | 4X10 | 4X10 |
| TRUNK                     | D    | C    | B     | C     | B     | A     | B     | A     | B     | C    | B     | A      | C    | C    | D    | C    | A    | C    | D    | B    | A    |

|                           |  |
|---------------------------|--|
| RUN #                     |  |
| ROOM NAME                 |  |
| RM LOSS MBH               |  |
| CFM PER RUN HEAT          |  |
| RM GAIN MBH               |  |
| CFM PER RUN COOLING       |  |
| ADJUSTED PRESSURE         |  |
| ACTUAL DUCT LGH.          |  |
| EQUIVALENT LENGTH         |  |
| TOTAL EFFECTIVE LENGTH    |  |
| ADJUSTED PRESSURE         |  |
| ROUND DUCT SIZE           |  |
| HEATING VELOCITY (ft/min) |  |
| COOLING VELOCITY (ft/min) |  |
| OUTLET GRILL SIZE         |  |
| TRUNK                     |  |

#### SUPPLY AIR TRUNK SIZE

| TRUNK   | CFM  | STATIC PRESS. | ROUND DUCT | RECT DUCT | VELOCITY (ft/min) |
|---------|------|---------------|------------|-----------|-------------------|
| TRUNK A | 354  | 0.07          | 9.8        | 12        | 531               |
| TRUNK B | 560  | 0.07          | 11.7       | 16        | 630               |
| TRUNK C | 352  | 0.07          | 9.8        | 12        | 528               |
| TRUNK D | 1135 | 0.07          | 15.2       | 26        | 786               |
| TRUNK E | 0    | 0.00          | 0          | 0         | 0                 |
| 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 M | 0    | 0.00          | 0          | 0         | 0                 |
| TRUNK N | 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 | 150  | 0.05          | 7.8        | 8         | 338               |
| TRUNK X | 1131 | 0.05          | 16.5       | 32        | 636               |
| TRUNK Y | 375  | 0.05          | 10.9       | 14        | 482               |
| TRUNK Z | 575  | 0.05          | 12.8       | 20        | 518               |
| DROP    | 1131 | 0.05          | 16.5       | 24        | 679               |

| RUN #                  | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8     | 9     | 10    | 11    | 12    | 14    | 15    | 16    | 17    | 19   | 21   | 22   | 23   | 24   |
|------------------------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|
| AIR VOLUME             | 135  | 85   | 85   | 75   | 155  | 340  | 75   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 181  | 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  | 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.       | 52   | 54   | 57   | 66   | 29   | 38   | 58   | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1    | 1    | 1    | 1    | 1    |
| EQUIVALENT LENGTH      | 185  | 175  | 195  | 215  | 190  | 235  | 220  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    | 0    | 0    | 0    |
| TOTAL EFFECTIVE LENGTH | 237  | 229  | 252  | 281  | 219  | 273  | 278  | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1    | 1    | 1    | 1    | 1    |
| ADJUSTED PRESSURE      | 0.06 | 0.06 | 0.06 | 0.05 | 0.07 | 0.05 | 0.05 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |
| ROUND DUCT SIZE        | 7.1  | 6    | 6    | 6    | 7.2  | 10.5 | 6    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 7.2  | 7.2  | 7.2  | 7.2  | 7.2  |
| INLET GRILL SIZE       | 8    | 8    | 8    | 8    | 8    | 8    | 8    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 8    | 8    | 8    | 8    | 8    |
| INLET GRILL SIZE       | X    | 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   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 14   | 14   | 14   | 14   | 14   |

TYPE: MOUNTAINASH 2  
SITE NAME: RUSSEL GARDENS PHASE 3

LO # 87257  
LOT 100

**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                | 6 @ 10.6 cfm | 53.0 cfm    |
| Table 9.32.3.A.            | TOTAL        | 180.2 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                               | 79.6 cfm |              |
| 5 Bedroom                               | 95.4 cfm |              |
| TOTAL                                   | 79.6 cfm |              |

| SUPPLEMENTAL VENTILATION CAPACITY |       | 9.32.3.5. |
|-----------------------------------|-------|-----------|
| Total Ventilation Capacity        | 180.2 | cfm       |
| Less Principal Ventil. Capacity   | 79.6  | cfm       |
| Required Supplemental Capacity    | 100.7 | cfm       |

| PRINCIPAL EXHAUST FAN CAPACITY                   |           |
|--------------------------------------------------|-----------|
| Model:                                           | VANEE 65H |
| Location:                                        | BSMT      |
| 79.6 cfm                                         | 3.0 sones |
| <input checked="" type="checkbox"/> HVI Approved |           |

| PRINCIPAL EXHAUST HEAT LOSS CALCULATION |        |        |        |      |
|-----------------------------------------|--------|--------|--------|------|
| CFM                                     | ΔT °F  | FACTOR | % LOSS |      |
| 79.6 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-2             | FV-05-11VK1 | 50        | <input checked="" type="checkbox"/> | 0.3   |
| ENS-3             | 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:                                                                                                         | August-20               |

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

LO#: 87257

Model: MOUNTAINASH 2

Builder: GREENPARK HOMES

Date: 27/08/2020

**Volume Calculation**
**House Volume**

| Level  | Floor Area (ft²) | Floor Height (ft) | Volume (ft³) |
|--------|------------------|-------------------|--------------|
| Bsmt   | 1297             | 9                 | 11673        |
| First  | 1297             | 11                | 14267        |
| Second | 1550             | 9                 | 13950        |
| Third  | 0                | 9                 | 0            |
| Fourth | 0                | 9                 | 0            |
| Total: |                  |                   | 39,890.0 ft³ |
| Total: |                  |                   | 1129.6 m³    |

**Air Change & Delta T Data**

|                                |       |
|--------------------------------|-------|
| WINTER NATURAL AIR CHANGE RATE | 0.347 |
| SUMMER NATURAL AIR CHANGE RATE | 0.124 |

**Design Temperature Difference**

|             | Tin °C | Tout °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**

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

$$0.347 \times 313.77 \times 39^\circ\text{C} \times 1.2 = 5124 \text{ W}$$

$$= 17481 \text{ Btu/h}$$

**6.2.6 Sensible Gain due to Air Leakage**

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

$$= 0.124 \times 313.77 \times 7^\circ\text{C} \times 1.2 = 333 \text{ W}$$

$$= 1135 \text{ Btu/h}$$

**5.2.3.2 Heat Loss due to Mechanical Ventilation**

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

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

**6.2.7 Sensible heat Gain due to Ventilation**

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

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

**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) | HLairbv Air Leakage + Ventilation Heat Loss (Btu/h) | Level Conductive Heat Loss: (HL <sub>level</sub> ) | Air Leakage Heat Loss Multiplier (LF x HLairbv / HL <sub>level</sub> ) |
|-------|-------------------|-----------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------|
| 1     | 0.5               | 17,481                                              | 8,614                                              | 1.015                                                                  |
| 2     | 0.3               |                                                     | 11,847                                             | 0.443                                                                  |
| 3     | 0.2               |                                                     | 12,226                                             | 0.286                                                                  |
| 4     | 0                 |                                                     | 0                                                  | 0.000                                                                  |
| 5     | 0                 |                                                     | 0                                                  | 0.000                                                                  |

\*HLairbv = Air leakage heat loss + ventilation heat loss

\*For a balanced or supply only ventilation system HLairve = 0

**HEAT LOSS AND GAIN SUMMARY SHEET**

|                             |                  |                                     |
|-----------------------------|------------------|-------------------------------------|
| <b>MODEL:</b> MOUNTAINASH 2 | <b>LOT 100</b>   | <b>BUILDER:</b> GREENPARK HOMES     |
| <b>SFQT:</b> 2847           | <b>LO#</b> 87257 | <b>SITE:</b> RUSSEL GARDENS PHASE 3 |

**DESIGN ASSUMPTIONS**

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

**BUILDING DATA**

|                                            |                       |                                  |          |
|--------------------------------------------|-----------------------|----------------------------------|----------|
| <b>ATTACHMENT:</b>                         | DETACHED              | <b># OF STORIES (+BASEMENT):</b> | 3        |
| <b>FRONT FACES:</b>                        | EAST                  | <b>ASSUMED (Y/N):</b>            | Y        |
| <b>AIR CHANGES PER HOUR:</b>               | 3.57                  | <b>ASSUMED (Y/N):</b>            | Y        |
| <b>AIR TIGHTNESS CATEGORY:</b>             | AVERAGE               | <b>ASSUMED (Y/N):</b>            | Y        |
| <b>WIND EXPOSURE:</b>                      | SHELTERED             | <b>ASSUMED (Y/N):</b>            | Y        |
| <b>HOUSE VOLUME (ft³):</b>                 | 39890.0               | <b>ASSUMED (Y/N):</b>            | Y        |
| <b>INTERNAL SHADING:</b>                   | BLINDS/CURTAINS       | <b>ASSUMED OCCUPANTS:</b>        | 5        |
| <b>INTERIOR LIGHTING LOAD (Btu/h/ft²):</b> | 1.27                  | <b>DC BRUSHLESS MOTOR (Y/N):</b> | Y        |
| <b>FOUNDATION CONFIGURATION</b>            | BCIN_1                | <b>DEPTH BELOW GRADE:</b>        | 6.0 ft   |
| <b>LENGTH:</b> 50.0 ft                     | <b>WIDTH:</b> 36.0 ft | <b>EXPOSED PERIMETER:</b>        | 172.0 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                   | -         |

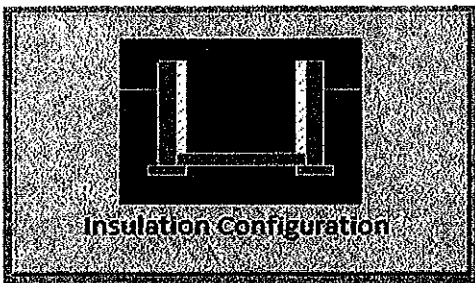
INDIVIDUAL BCIN: 19669

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):              | 15.2                                      |  |
| Floor Width (m):               | 11.0                                      |                                                                                     |
| Exposed Perimeter (m):         | 0.0                                       |                                                                                     |
| Wall Height (m):               | 2.7                                       |                                                                                     |
| Depth Below Grade (m):         | 1.83                                      |                                                                                     |
| Window Area (m <sup>2</sup> ): | 1.4                                       |                                                                                     |
| 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):          | 1664                                      |                                                                                     |

TYPE: MOUNTAINASH 2  
LO# 87257

LOT 100

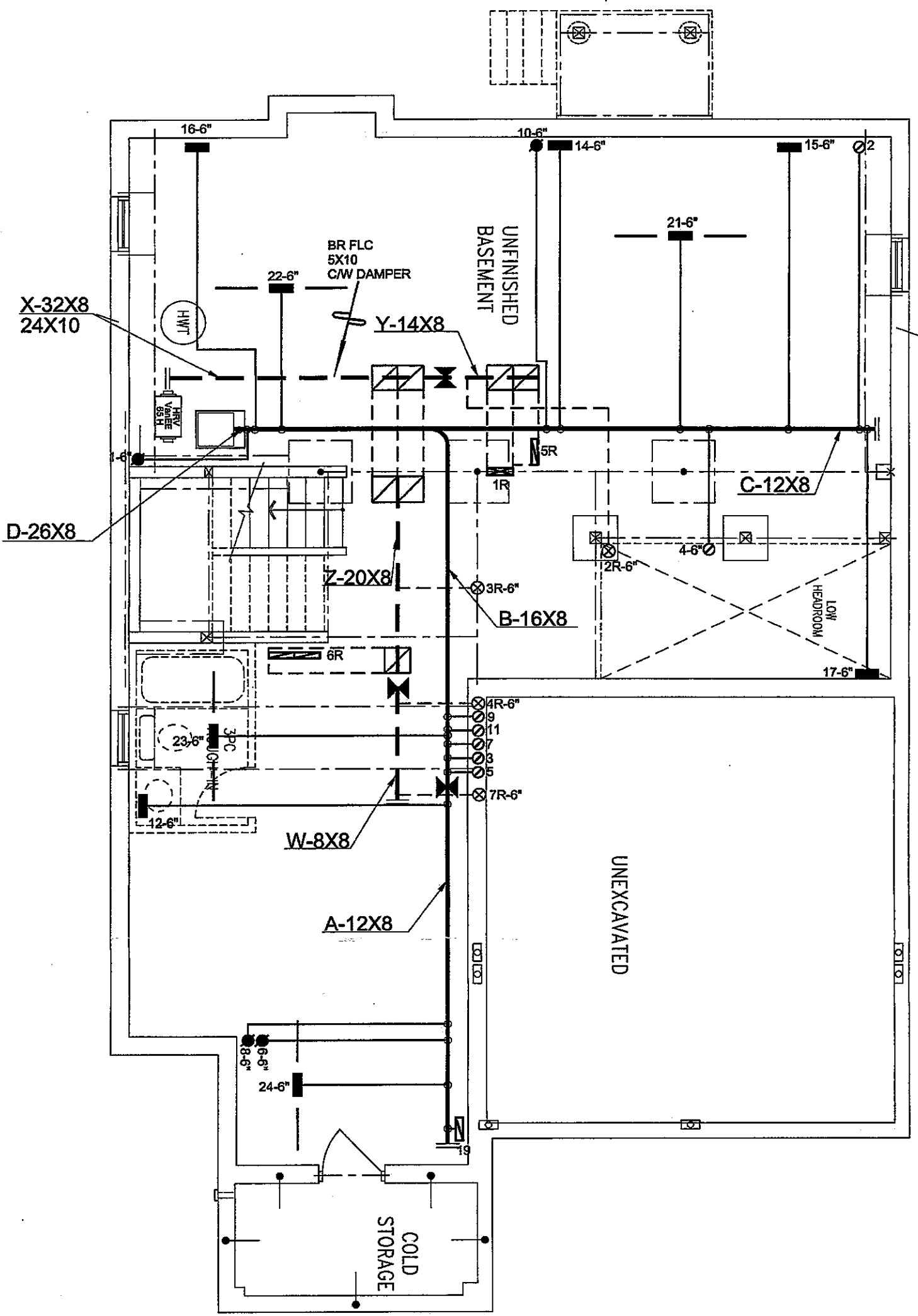
## Air Infiltration Residential Load Calculator

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):       | 7.92                       |                        |    |    |
| Building Configuration            |                            |                        |    |    |
| Type:                             | Detached                   |                        |    |    |
| Number of Stories:                | Two                        |                        |    |    |
| Foundation:                       | Full                       |                        |    |    |
| House Volume (m <sup>3</sup> ):   | 1129.6                     |                        |    |    |
| Air Leakage/Ventilation           |                            |                        |    |    |
| Air Tightness Type:               | Present (1961-) (3.57 ACH) |                        |    |    |
| Custom BDT Data:                  | ELA @ 10 Pa.               | 1505.7 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): | 0.347                      |                        |    |    |
| Cooling Air Leakage Rate (ACH/H): | 0.124                      |                        |    |    |

TYPE: MOUNTAINASH 2  
LO# 87257

LOT 100



BASEMENT PLAN - ELEV. 3

I MICHAEL O'Rourke HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.3.1.5 OF THE BUILDING CODE.  
*Michael O'Rourke*  
Michael O'Rourke, BCIN# 19669  
HVAC DESIGNS LTD.

CSA-F280-12

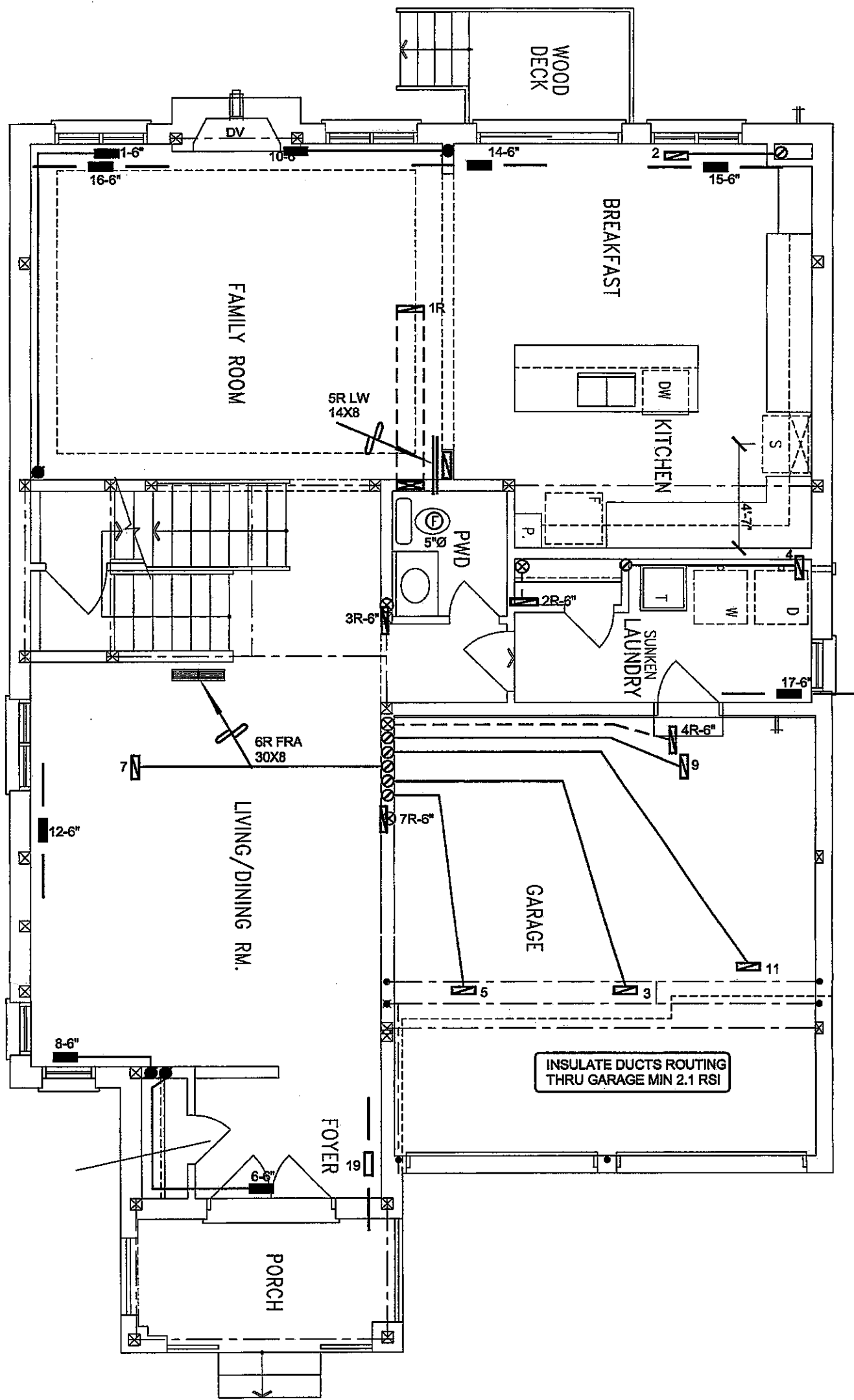
LOT 100 PACKAGE A1

| 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.       | Description Date |
|             | SUPPLY AIR BOOT ABOVE     |        | 6" SUPPLY AIR STACK 2nd FLOOR   |        | FRA- FLOOR RETURN AIR GRILLE |        | REDUCER                    | REVISIONS |                  |

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|                                                                     |                                                                                                                                                                                                                                                                                                                                       |                                    |                      |                                                                                                                                              |  |           |   |             |                               |          |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--|-----------|---|-------------|-------------------------------|----------|
| Client<br><b>GREENPARK HOMES</b>                                    | <div><p>375 Finley Ave. Suite 202 - Ajax, Ontario<br/>L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375<br/>Email: info@hvacadesigns.ca<br/>Web: www.hvacadesigns.ca<br/>Specializing in Residential Mechanical Design Services</p></div> | HEAT LOSS 52321 BTU/H<br>UNIT DATA |                      | # OF RUNS S/A R/A FANS                                                                                                                       |  |           |   | Sheet Title |                               |          |
|                                                                     |                                                                                                                                                                                                                                                                                                                                       | MAKE                               | GOODMAN              | 3RD FLOOR                                                                                                                                    |  |           |   |             | BASEMENT<br>HEATING<br>LAYOUT |          |
|                                                                     |                                                                                                                                                                                                                                                                                                                                       | MODEL                              | GMEC960603BNA        | 2ND FLOOR                                                                                                                                    |  | 11        | 5 | 3           |                               |          |
|                                                                     |                                                                                                                                                                                                                                                                                                                                       | INPUT                              | 60 MBTU/H            | 1ST FLOOR                                                                                                                                    |  | 6         | 2 | 2           |                               |          |
|                                                                     |                                                                                                                                                                                                                                                                                                                                       | OUTPUT                             | 57.6 MBTU/H          | BASEMENT                                                                                                                                     |  | 4         | 1 | 0           | Date                          | AUG/2020 |
| Project Name<br><b>RUSSEL GARDENS PHASE 3<br/>HAMILTON, ONTARIO</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.                                                                               | COOLING                            | 3.0 TONS             | 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 |  |           |   | Scale       | 3/16" = 1'-0"                 |          |
|                                                                     |                                                                                                                                                                                                                                                                                                                                       | FAN SPEED                          | 1131 cfm @ 0.6" w.c. |                                                                                                                                              |  |           |   | BCIN# 19669 |                               |          |
|                                                                     |                                                                                                                                                                                                                                                                                                                                       |                                    |                      |                                                                                                                                              |  | LO# 87257 |   |             |                               |          |
| LOT 100<br>MOUNTAINASH 2 2847 sqft                                  |                                                                                                                                                                                                                                                                                                                                       |                                    |                      |                                                                                                                                              |  |           |   |             |                               |          |





GROUND FLOOR PLAN – ELEV. 3

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

CSA-F280-12  
LOT 100 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.       | Description |
|             | SUPPLY AIR BOOT ABOVE     |        | 6" SUPPLY AIR STACK 2nd FLOOR   |        | FRA- FLOOR RETURN AIR GRILLE |        | REDUCER                    |           | Date        |
|             |                           |        |                                 |        |                              |        |                            | REVISIONS |             |

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Client  
**GREENPARK HOMES**

Project Name  
**RUSSEL GARDENS PHASE 3  
HAMILTON, ONTARIO**

**LOT 100  
MOUNTAINASH 2 2847 sqft**

**HVACDESIGNS LTD.**  
375 Finley Ave. Suite 202 - Ajax, Ontario  
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 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 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.

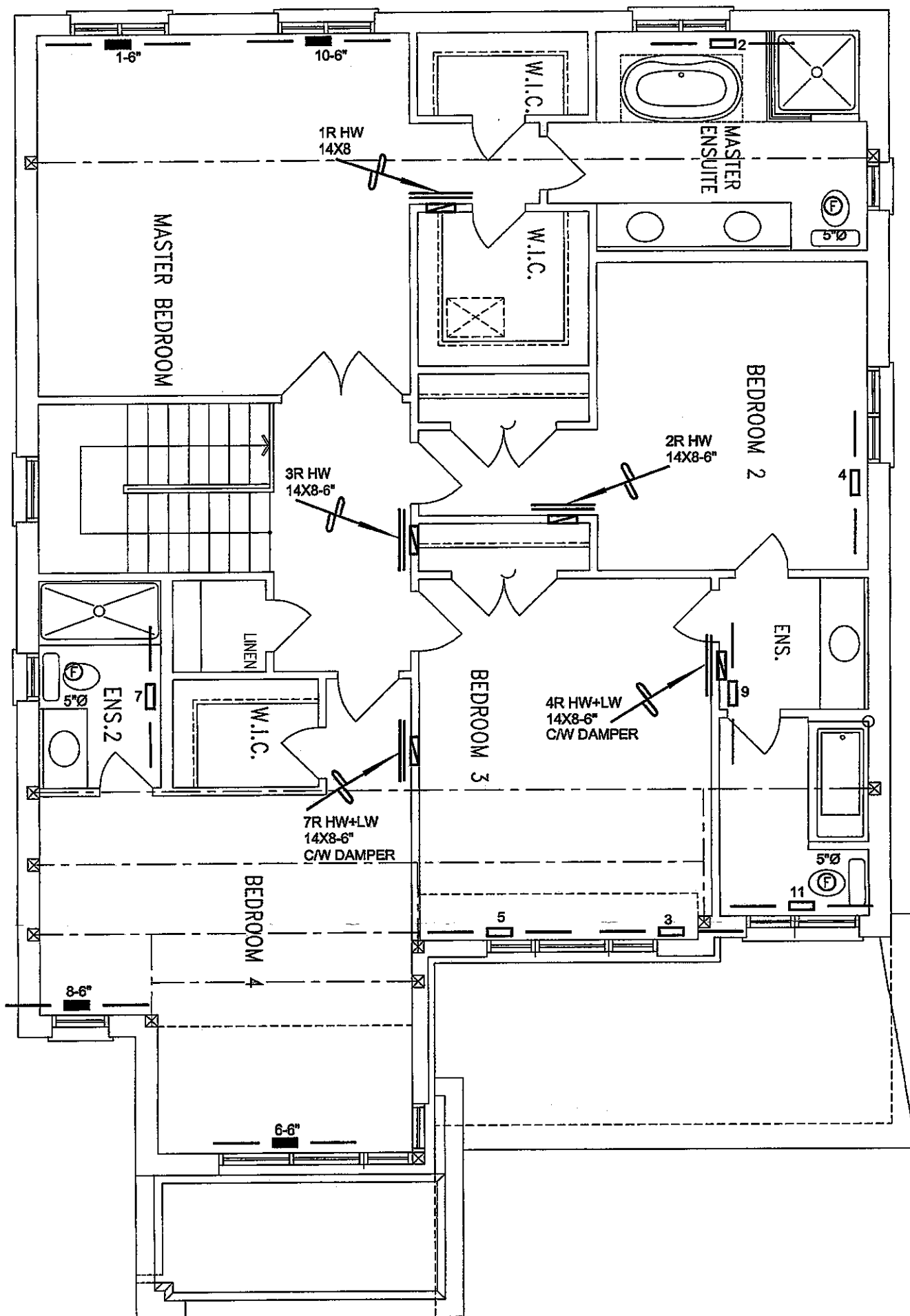
Sheet Title  
**FIRST FLOOR  
HEATING  
LAYOUT**

Date  
**AUG/2020**

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

BCIN# 19669

LO# **87257**



SECOND FLOOR PLAN (4 BEDROOM) – ELEV. 3

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.

CSA-F280-12  
LOT 100 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\"x6\" 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                    | 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@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. | Sheet Title<br><b>SECOND FLOOR HEATING LAYOUT</b> |  |  |
| Project Name<br><b>RUSSEL GARDENS PHASE 3<br/>HAMILTON, ONTARIO</b> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Date<br><b>AUG/2020</b>                           |  |  |
| LOT 100<br>MOUNTAINASH 2 2847 sqft                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Scale<br><b>3/16" = 1'-0"</b>                     |  |  |
|                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | BCIN# 19669                                       |  |  |
|                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | LO# 87257                                         |  |  |