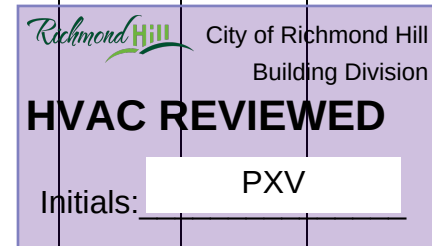


| SITE NAME: TRINIGROUP          |            | WOB           |             | GFA: 2258 |            | DATE: Sep-23 |              | WINTER NATURAL AIR CHANGE RATE 0.377 |             | HEAT LOSS ΔT °F. 78 |  | CSA-F280-12      |  |
|--------------------------------|------------|---------------|-------------|-----------|------------|--------------|--------------|--------------------------------------|-------------|---------------------|--|------------------|--|
| BUILDER: GREENPARK HOMES       |            | TYPE: VILLA 1 |             |           |            | LO# 102631   |              | SUMMER NATURAL AIR CHANGE RATE 0.118 |             | HEAT GAIN ΔT °F. 13 |  | SB-12 PACKAGE A1 |  |
| ROOM USE                       |            | MBR           | ENS         | WIC       | BED-2      | BED-3        | BED-4        | BATH                                 | HALL        |                     |  |                  |  |
| EXP. WALL                      |            | 32            | 21          | 7         | 13         | 29           | 30           | 6                                    | 14          |                     |  |                  |  |
| CLG. HT.                       |            | 9             | 9           | 9         | 9          | 9            | 9            | 9                                    | 9           |                     |  |                  |  |
| FACTORS                        |            |               |             |           |            |              |              |                                      |             |                     |  |                  |  |
| GRS.WALL AREA                  | LOSS GAIN  | 291           | 191         | 64        | 118        | 264          | 273          | 55                                   | 127         |                     |  |                  |  |
| GLAZING                        |            | LOSS GAIN     | LOSS GAIN   | LOSS GAIN | LOSS GAIN  | LOSS GAIN    | LOSS GAIN    | LOSS GAIN                            | LOSS GAIN   |                     |  |                  |  |
| NORTH                          | 21.8 16.0  | 0 0 0         | 7 152 112   | 0 0 0     | 10 218 160 | 0 0 0        | 0 0 0        | 0 0 0                                | 0 0 0       | 0 0 0               |  |                  |  |
| EAST                           | 21.8 41.6  | 0 0 0         | 0 0 0       | 0 0 0     | 0 0 0      | 45 980 1870  | 39 850 1621  | 0 0 0                                | 0 0 0       | 0 0 0               |  |                  |  |
| SOUTH                          | 21.8 24.9  | 0 0 0         | 0 0 0       | 0 0 0     | 0 0 0      | 0 0 0        | 0 0 0        | 0 0 0                                | 18 392 448  |                     |  |                  |  |
| WEST                           | 21.8 41.6  | 20 436 831    | 16 349 665  | 0 0 0     | 0 0 0      | 0 0 0        | 0 0 0        | 0 0 0                                | 0 0 0       | 0 0 0               |  |                  |  |
| SKYL.T.                        | 38.1 101.5 | 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               |  |                  |  |
| DOORS                          | 20.5 3.4   | 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               |  |                  |  |
| NET EXPOSED WALL               | 4.6 0.8    | 271 1239 204  | 168 768 126 | 64 291 48 | 108 495 81 | 219 1000 165 | 234 1069 176 | 55 249 41                            | 109 500 82  |                     |  |                  |  |
| NET EXPOSED BSMT WALL ABOVE GR | 3.7 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                    | 1.3 0.6    | 278 365 163   | 158 208 93  | 66 87 39  | 146 192 86 | 129 169 76   | 140 184 82   | 90 118 53                            | 237 311 139 |                     |  |                  |  |
| NO ATTIC EXPOSED CLG           | 2.8 1.3    | 0 0 0         | 0 0 0       | 0 0 0     | 0 0 0      | 51 144 64    | 0 0 0        | 0 0 0                                | 0 0 0       |                     |  |                  |  |
| EXPOSED FLOOR                  | 2.6 0.4    | 0 0 0         | 0 0 0       | 0 0 0     | 0 0 0      | 180 470 77   | 27 70 12     | 64 167 27                            | 52 136 22   |                     |  |                  |  |
| BASEMENT/CRAWL HEAT LOSS       |            | 0             | 0           | 0         | 0          | 0            | 0            | 0                                    | 0           |                     |  |                  |  |
| SLAB ON GRADE HEAT LOSS        |            | 0             | 0           | 0         | 0          | 0            | 0            | 0                                    | 0           |                     |  |                  |  |
| SUBTOTAL HT LOSS               |            | 2040          | 1477        | 378       | 904        | 2763         | 2173         | 535                                  | 1339        |                     |  |                  |  |
| SUB TOTAL HT GAIN              |            |               | 1198        | 996       | 87         | 327          | 2252         | 1890                                 | 692         |                     |  |                  |  |
| LEVEL FACTOR / MULTIPLIER      | 0.20 0.27  |               | 0.20 0.27   | 0.20 0.27 | 0.20 0.27  | 0.20 0.27    | 0.20 0.27    | 0.20 0.27                            | 0.20 0.27   |                     |  |                  |  |
| AIR CHANGE HEAT LOSS           |            | 554           | 401         | 103       | 246        | 751          | 590          | 145                                  | 364         |                     |  |                  |  |
| AIR CHANGE HEAT GAIN           |            | 77            | 64          | 6         | 21         | 145          | 122          | 8                                    | 45          |                     |  |                  |  |
| DUCT LOSS                      |            | 0             | 0           | 0         | 0          | 351          | 276          | 68                                   | 170         |                     |  |                  |  |
| DUCT GAIN                      |            | 0             | 0           | 0         | 0          | 315          | 277          | 13                                   | 74          |                     |  |                  |  |
| HEAT GAIN PEOPLE               | 240        | 2             | 480         | 0         | 0          | 1 240        | 1 240        | 0                                    | 0           |                     |  |                  |  |
| HEAT GAIN APPLIANCES/LIGHTS    |            |               | 517         | 0         | 0          | 517          | 517          | 0                                    | 0           |                     |  |                  |  |
| TOTAL HT LOSS BTU/H            |            | 2594          | 1878        | 480       | 1150       | 3865         | 3040         | 748                                  | 1873        |                     |  |                  |  |
| TOTAL HT GAIN x 1.3 BTU/H      |            |               | 2954        | 1378      | 120        | 1437         | 4510         | 185                                  | 1053        |                     |  |                  |  |



| ROOM USE                       |            | DIN          | KT/BF        | FAM          | PWD       | FOY          | MUD         |              |       | WOB          | BAS       |
|--------------------------------|------------|--------------|--------------|--------------|-----------|--------------|-------------|--------------|-------|--------------|-----------|
| EXP. WALL                      |            | 30           | 32           | 29           | 10        | 33           | 23          |              |       | 38           | 116       |
| CLG. HT.                       |            | 10           | 10           | 10           | 10        | 10           | 10          |              |       | 9            | 9         |
| FACTORS                        |            |              |              |              |           |              |             |              |       |              |           |
| GRS.WALL AREA                  | LOSS GAIN  | 303          | 323          | 293          | 101       | 333          | 232         |              |       | 323          | 638       |
| GLAZING                        |            | LOSS GAIN    | LOSS GAIN    | LOSS GAIN    | LOSS GAIN | LOSS GAIN    | LOSS GAIN   |              |       | LOSS GAIN    | LOSS GAIN |
| NORTH                          | 21.8 16.0  | 0 0 0        | 0 0 0        | 0 0 0        | 0 0 0     | 0 0 0        | 0 0 0       | 0 0 0        | 0 0 0 | 3 65 48      |           |
| EAST                           | 21.8 41.6  | 0 0 0        | 0 0 0        | 0 0 0        | 0 0 0     | 22 479 914   | 0 0 0       | 0 0 0        | 0 0 0 | 0 0 0        |           |
| SOUTH                          | 21.8 24.9  | 25 545 622   | 0 0 0        | 0 0 0        | 7 152 174 | 0 0 0        | 0 0 0       | 0 0 0        | 0 0 0 | 3 65 75      |           |
| WEST                           | 21.8 41.6  | 0 0 0        | 58 1263 2410 | 22 479 914   | 0 0 0     | 0 0 0        | 0 0 0       | 0 0 0        | 0 0 0 | 0 0 0        |           |
| SKYL.T.                        | 38.1 101.5 | 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        |           |
| DOORS                          | 20.5 3.4   | 0 0 0        | 0 0 0        | 0 0 0        | 0 0 0     | 22 452 74    | 21 431 71   | 0 0 0        | 0 0 0 | 21 431 71    |           |
| NET EXPOSED WALL               | 4.6 0.8    | 278 1270 209 | 265 1212 199 | 271 1238 204 | 94 429 71 | 289 1322 217 | 211 965 159 | 265 1211 199 | 0 0 0 | 0 0 0        |           |
| NET EXPOSED BSMT WALL ABOVE GR | 3.7 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 | 348 1282 211 |           |
| EXPOSED CLG                    | 1.3 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 | 0 0 0        |           |
| NO ATTIC EXPOSED CLG           | 2.8 1.3    | 0 0 0        | 0 0 0        | 0 0 0        | 0 0 0     | 0 0 0        | 0 0 0       | 0 0 0        | 0 0 0 | 0 0 0        |           |
| EXPOSED FLOOR                  | 2.6 0.4    | 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        |           |
| BASEMENT/CRAWL HEAT LOSS       |            | 0            | 0            | 0            | 0         | 0            | 0           | 0            | 0     | 2175         |           |
| SLAB ON GRADE HEAT LOSS        |            | 0            | 0            | 0            | 0         | 0            | 0           | 0            | 0     |              |           |
| SUBTOTAL HT LOSS               |            | 1815         | 2475         | 1717         | 582       | 2252         | 1396        | 460          | 2934  | 4019         |           |
| SUB TOTAL HT GAIN              |            |              | 831          | 2609         | 245       | 1206         | 230         | 2609         |       | 404          |           |
| LEVEL FACTOR / MULTIPLIER      | 0.30 0.46  |              | 0.30 0.46    | 0.30 0.46    | 0.30 0.46 | 0.30 0.46    | 0.30 0.46   | 0.50 1.13    |       |              |           |
| AIR CHANGE HEAT LOSS           |            | 839          | 1144         | 793          | 269       | 1041         | 645         | 7885         |       |              |           |
| AIR CHANGE HEAT GAIN           |            | 54           | 168          | 72           | 16        | 78           | 15          | 194          |       |              |           |
| 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            |       |              |           |
| HEAT GAIN APPLIANCES/LIGHTS    |            |              | 517          | 517          | 0         | 0            | 0           | 0            |       |              |           |
| TOTAL HT LOSS BTU/H            |            | 2653         | 3619         | 2510         | 851       | 3293         | 2042        | 2934         | 11904 |              |           |
| TOTAL HT GAIN x 1.3 BTU/H      |            |              | 1823         | 4283         | 2219      | 339          | 1669        | 318          | 3392  | 1451         |           |

TOTAL HEAT GAIN BTU/H:

31366

TONS: 2.61

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 45435

TOTAL COMBINED HEAT LOSS BTU/H: 47105

SITE NAME: TRINIGROUP  
BUILDER: GREENPARK HOMESWOB  
TYPE: VILLA 1

DATE: Sep-23

GFA: 2258 LO# 102631

HEATING CFM 978 COOLING CFM 978  
TOTAL HEAT LOSS 45,435 TOTAL HEAT GAIN 31,091  
AIR FLOW RATE CFM 21.53 AIR FLOW RATE CFM 31.46furnace pressure 0.7  
furnace filter 0.14  
a/c coil pressure 0.24  
available pressure  
for s/a & r/a 0.32#GOODMAN  
GMEC960603BNA 60AFUE = 96 %  
INPUT (BTU/H) = 60,000  
OUTPUT (BTU/H) = 57,600

| RUN COUNT | 4th | 3rd | 2nd | 1st | Bas |
|-----------|-----|-----|-----|-----|-----|
| S/A       | 0   | 0   | 13  | 8   | 5   |
| R/A       | 0   | 0   | 5   | 1   | 1   |

plenum pressure s/a 0.17 r/a pressure 0.15  
max s/a dif press. loss 0.01 r/a grille press. Loss 0.02  
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.13FAN SPEED LOW  
MEDLOW 978  
MEDIUM 1017  
MEDIUM HIGH 1017  
HIGH 1131DESIGN CFM = 978  
CFM @ .7" E.S.P.

TEMPERATURE RISE 55 °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   | 20   | 21   | 22   | 23   | 24   |
|---------------------------|------|------|------|-------|-------|-------|------|------|-------|------|-------|------|------|-------|-------|------|------|------|------|------|------|------|------|------|
| ROOM NAME                 | MBR  | ENS  | WIC  | BED-2 | BED-3 | BED-4 | BATH | HALL | BED-3 | MBR  | BED-4 | ENS  | DIN  | KT/BF | KT/BF | FAM  | FAM  | PWD  | FOY  | MUD  | BAS  | BAS  | BAS  | BAS  |
| RM LOSS MBH.              | 1.30 | 0.94 | 0.48 | 1.15  | 1.93  | 1.52  | 0.37 | 1.87 | 1.93  | 1.30 | 1.52  | 0.94 | 2.65 | 1.81  | 1.81  | 1.26 | 1.26 | 0.85 | 3.29 | 2.04 | 2.97 | 2.97 | 2.97 | 2.97 |
| CFM PER RUN HEAT          | 28   | 20   | 10   | 25    | 42    | 33    | 8    | 40   | 42    | 28   | 33    | 20   | 57   | 39    | 39    | 27   | 27   | 18   | 71   | 44   | 64   | 64   | 64   | 64   |
| RM GAIN MBH.              | 1.48 | 0.69 | 0.12 | 1.44  | 2.26  | 1.98  | 0.09 | 1.05 | 2.26  | 1.48 | 1.98  | 0.69 | 1.82 | 2.14  | 2.14  | 1.11 | 1.11 | 0.34 | 1.67 | 0.32 | 0.97 | 0.97 | 0.97 | 0.97 |
| CFM PER RUN COOLING       | 46   | 22   | 4    | 45    | 71    | 62    | 3    | 33   | 71    | 46   | 62    | 22   | 57   | 67    | 67    | 35   | 35   | 11   | 52   | 10   | 30   | 30   | 30   | 30   |
| ADJUSTED PRESSURE         | 0.16 | 0.16 | 0.16 | 0.16  | 0.16  | 0.16  | 0.16 | 0.16 | 0.16  | 0.16 | 0.16  | 0.16 | 0.16 | 0.16  | 0.16  | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| ACTUAL DUCT LGH.          | 43   | 49   | 39   | 32    | 45    | 52    | 43   | 38   | 47    | 28   | 65    | 31   | 16   | 16    | 23    | 31   | 20   | 35   | 36   | 20   | 39   | 25   | 16   | 38   |
| EQUIVALENT LENGTH         | 160  | 160  | 160  | 160   | 120   | 140   | 180  | 130  | 140   | 100  | 180   | 140  | 140  | 110   | 110   | 160  | 130  | 140  | 110  | 140  | 190  | 140  | 120  | 130  |
| TOTAL EFFECTIVE LENGTH    | 203  | 209  | 199  | 192   | 165   | 192   | 223  | 168  | 187   | 128  | 245   | 171  | 156  | 126   | 133   | 191  | 150  | 175  | 146  | 160  | 229  | 165  | 136  | 168  |
| ADJUSTED PRESSURE         | 0.08 | 0.07 | 0.08 | 0.08  | 0.09  | 0.08  | 0.07 | 0.09 | 0.08  | 0.12 | 0.06  | 0.09 | 0.1  | 0.12  | 0.12  | 0.08 | 0.1  | 0.09 | 0.11 | 0.1  | 0.07 | 0.09 | 0.12 | 0.09 |
| ROUND DUCT SIZE           | 5    | 4    | 4    | 6     | 5     | 6     | 4    | 4    | 5     | 4    | 6     | 4    | 5    | 5     | 5     | 4    | 4    | 4    | 5    | 4    | 5    | 5    | 5    | 5    |
| HEATING VELOCITY (ft/min) | 206  | 229  | 115  | 127   | 308   | 168   | 92   | 459  | 308   | 321  | 168   | 229  | 419  | 286   | 286   | 310  | 310  | 207  | 521  | 505  | 470  | 470  | 470  | 470  |
| COOLING VELOCITY (ft/min) | 338  | 252  | 46   | 229   | 521   | 316   | 34   | 379  | 521   | 528  | 316   | 252  | 419  | 492   | 492   | 402  | 402  | 126  | 382  | 115  | 220  | 220  | 220  | 220  |
| OUTLET GRILL SIZE         | 3X10 | 3X10 | 3X10 | 4X10  | 3X10  | 4X10  | 3X10 | 3X10 | 3X10  | 3X10 | 4X10  | 3X10 | 3X10 | 3X10  | 3X10  | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 |
| TRUNK                     | B    | A    | D    | B     | D     | C     | D    | D    | D     | B    | C     | B    | B    | A     | A     | A    | A    | C    | C    | B    | A    | A    | B    | C    |

|                           |      |      |
|---------------------------|------|------|
| RUN #                     | 25   | 26   |
| ROOM NAME                 | BAS  | BATH |
| RM LOSS MBH.              | 2.97 | 0.37 |
| CFM PER RUN HEAT          | 64   | 8    |
| RM GAIN MBH.              | 0.97 | 0.09 |
| CFM PER RUN COOLING       | 30   | 3    |
| ADJUSTED PRESSURE         | 0.16 | 0.16 |
| ACTUAL DUCT LGH.          | 33   | 38   |
| EQUIVALENT LENGTH         | 180  | 170  |
| TOTAL EFFECTIVE LENGTH    | 213  | 208  |
| ADJUSTED PRESSURE         | 0.07 | 0.08 |
| ROUND DUCT SIZE           | 5    | 4    |
| HEATING VELOCITY (ft/min) | 470  | 92   |
| COOLING VELOCITY (ft/min) | 220  | 34   |
| OUTLET GRILL SIZE         | 3X10 | 3X10 |
| TRUNK                     | A    | D    |



City of Richmond Hill  
Building Division

## HVAC REVIEWED

Initials: **PXV**

## SUPPLY AIR TRUNK SIZE

| TRUNK A |              |                  |               |              |   |                      | TRUNK G |              |                  |               |              |   |                      |   |
|---------|--------------|------------------|---------------|--------------|---|----------------------|---------|--------------|------------------|---------------|--------------|---|----------------------|---|
|         | TRUNK<br>CFM | STATIC<br>PRESS. | ROUND<br>DUCT | RECT<br>DUCT |   | VELOCITY<br>(ft/min) |         | TRUNK<br>CFM | STATIC<br>PRESS. | ROUND<br>DUCT | RECT<br>DUCT |   | VELOCITY<br>(ft/min) |   |
| TRUNK A | 344          | 0.07             | 9.7           | 12           | x | 8                    | 516     | TRUNK G      | 0                | 0.00          | 0            | x | 8                    | 0 |
| TRUNK B | 610          | 0.07             | 12            | 16           | x | 8                    | 686     | TRUNK H      | 0                | 0.00          | 0            | x | 8                    | 0 |
| TRUNK C | 219          | 0.06             | 8.5           | 8            | x | 8                    | 493     | TRUNK I      | 0                | 0.00          | 0            | x | 8                    | 0 |
| TRUNK D | 369          | 0.06             | 10.4          | 14           | x | 8                    | 474     | TRUNK J      | 0                | 0.00          | 0            | x | 8                    | 0 |
| TRUNK E | 0            | 0.00             | 0             | 0            | x | 8                    | 0       | TRUNK K      | 0                | 0.00          | 0            | x | 8                    | 0 |
| TRUNK F | 0            | 0.00             | 0             | 0            | x | 8                    | 0       | TRUNK L      | 0                | 0.00          | 0            | x | 8                    | 0 |

## RETURN AIR TRUNK SIZE

|         | TRUNK<br>CFM | STATIC<br>PRESS. | ROUND<br>DUCT | RECT<br>DUCT |   | VELOCITY<br>(ft/min) |     |
|---------|--------------|------------------|---------------|--------------|---|----------------------|-----|
| TRUNK O | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK P | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK Q | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK R | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK S | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK T | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK U | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK V | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK W | 0            | 0.05             | 0             | 0            | x | 8                    | 0   |
| TRUNK X | 978          | 0.05             | 15.6          | 28           | x | 8                    | 629 |
| TRUNK Y | 621          | 0.05             | 13.2          | 20           | x | 8                    | 559 |
| TRUNK Z | 170          | 0.05             | 8.1           | 8            | x | 8                    | 383 |
| DROP    | 978          | 0.05             | 15.6          | 24           | x | 10                   | 587 |

|                    |      |      |      |      |      |      |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |      |
|--------------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| RETURN AIR #       | 1    | 2    | 3    | 4    | 5    | 6    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | BR   |
|                    | 0    | 0    | 0    | 0    | 0    | 0    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |      |
| AIR VOLUME         | 98   | 99   | 85   | 85   | 85   | 366  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 160  |
| PLENUM PRESSURE    | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13  | 0.13 |
| ACTUAL DUCT LGH.   | 33   | 29   | 55   | 64   | 52   | 31   | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 14   |
| EQUIVALENT LENGTH  | 135  | 140  | 195  | 200  | 190  | 185  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 135  |
| TOTAL EFFECTIVE LH | 168  | 169  | 250  | 264  | 242  | 216  | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 149  |
| ADJUSTED PRESSURE  | 0.08 | 0.08 | 0.05 | 0.05 | 0.06 | 0.06 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 13.36 | 0.09 |
| ROUND DUCT SIZE    | 5.9  | 5.9  | 6    | 6    | 6    | 10.3 | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 6.9  |
| INLET GRILL SIZE   | 8    | 8    | 8    | 8    | 8    | 8    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 8    |
|                    | X    | X    | X    | X    | X    | X    | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X     | X    |
| INLET GRILL SIZE   | 14   | 14   | 14   | 14   | 14   | 30   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 14   |

CITY OF RICHMOND HILL  
BUILDING DIVISION

05/01/2024

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TYPE: VILLA 1  
SITE NAME: TRINIGROUP

LO # 102631  
WOB

**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  | <u>2</u> @ 21.2 cfm <u>42.4</u> cfm |             |
| Other Bedrooms             | <u>3</u> @ 10.6 cfm <u>31.8</u> cfm |             |
| Kitchen & Bathrooms        | <u>4</u> @ 10.6 cfm <u>42.4</u> cfm |             |
| Other Rooms                | <u>3</u> @ 10.6 cfm <u>31.8</u> cfm |             |
| Table 9.32.3.A.            | TOTAL <u>148.4</u> 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        | <u>148.4</u> cfm |           |
| Less Principal Ventil. Capacity   | <u>79.5</u> cfm  |           |
| Required Supplemental Capacity    | <u>68.9</u> cfm  |           |

| PRINCIPAL EXHAUST FAN CAPACITY |                                                  |
|--------------------------------|--------------------------------------------------|
| Model: VANEE V150H             | Location: BSMT                                   |
| <u>79.5</u> cfm                | <input checked="" type="checkbox"/> HVI Approved |

| PRINCIPAL EXHAUST HEAT LOSS CALCULATION |        |        |        |      |
|-----------------------------------------|--------|--------|--------|------|
| CFM                                     | ΔT °F  | FACTOR | % LOSS |      |
| 79.5 CFM                                | X 78 F | X 1.08 | X      | 0.25 |

| SUPPLEMENTAL FANS |                          | BY INSTALLING CONTRACTOR |                                     |       |
|-------------------|--------------------------|--------------------------|-------------------------------------|-------|
| Location          | Model                    | cfm                      | HVI                                 | Sones |
| ENS               | BY INSTALLING CONTRACTOR | 50                       | <input checked="" type="checkbox"/> | 3.5   |
| BATH              | BY INSTALLING CONTRACTOR | 50                       | <input checked="" type="checkbox"/> | 3.5   |
| PWD               | BY INSTALLING CONTRACTOR | 50                       | <input checked="" type="checkbox"/> | 3.5   |

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

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

| BUILDER:        |                       |
|-----------------|-----------------------|
| GREENPARK HOMES |                       |
| Name:           |                       |
| Address:        |                       |
| City:           | City of Richmond Hill |
| Telephone #:    | Building Division     |

| INSTALLING CONTRACTOR |        |
|-----------------------|--------|
| Name:                 | PXV    |
| 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:                                                                                                         | September-23            |

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: 19669

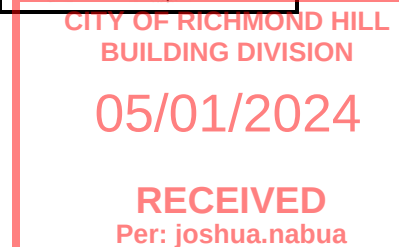
MICHAEL O'ROURKE

*Michael O'Rourke*

05/01/2024

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Per: joshua.nabua

| CSA F280-12 Residential Heat Loss and Heat Gain Calculations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------|-------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|------|-------|--------|-------|-------|--------|------|--------|---------|-------|-----|--------|-------|--------|---|---|-------|--------|---|---|--------------|--------|--|--|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------|-------|--------------------------------|-------|-------------------------------|--|--|--|--|--|--------|---------|-------|-------|-------------|----|-----|----|----|-------------|----|----|---|----|
| Formula Sheet (For Air Leakage / Ventilation Calculation)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| LO#: 102631                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Model: VILLA 1    | Builder: GREENPARK HOMES                            | Date: 9/25/2023                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>Volume Calculation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                                                     | <b>Air Change &amp; Delta T Data</b>                                                                                                   |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>House Volume</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr><td>Bsmt</td><td>980</td><td>9</td><td>8330</td></tr> <tr><td>First</td><td>980</td><td>10</td><td>9898</td></tr> <tr><td>Second</td><td>1298</td><td>9</td><td>11811.8</td></tr> <tr><td>Third</td><td>0</td><td>9</td><td>0</td></tr> <tr><td>Fourth</td><td>0</td><td>9</td><td>0</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>30,039.8 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>850.6 m³</td></tr> </tbody> </table>                                                                                                                                                                                                                                                                 |                   |                                                     | Level                                                                                                                                  | Floor Area (ft²)                                          | Floor Height (ft) | Volume (ft³)      | Bsmt                                                | 980                                                 | 9                                                         | 8330 | First | 980    | 10    | 9898  | Second | 1298 | 9      | 11811.8 | Third | 0   | 9      | 0     | Fourth | 0 | 9 | 0     | Total: |   |   | 30,039.8 ft³ | Total: |  |  | 850.6 m³ | <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">0.377</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.118</td> </tr> </table><br><table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td>22</td> <td>-21</td> <td>43</td> <td>78</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </table> |  | WINTER NATURAL AIR CHANGE RATE | 0.377 | SUMMER NATURAL AIR CHANGE RATE | 0.118 | Design Temperature Difference |  |  |  |  |  | Tin °C | Tout °C | ΔT °C | ΔT °F | Winter DTDh | 22 | -21 | 43 | 78 | Summer DTDc | 24 | 31 | 7 | 13 |
| Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Floor Area (ft²)  | Floor Height (ft)                                   | Volume (ft³)                                                                                                                           |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Bsmt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 980               | 9                                                   | 8330                                                                                                                                   |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| First                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 980               | 10                                                  | 9898                                                                                                                                   |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Second                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1298              | 9                                                   | 11811.8                                                                                                                                |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Third                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0                 | 9                                                   | 0                                                                                                                                      |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Fourth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0                 | 9                                                   | 0                                                                                                                                      |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Total:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                                                     | 30,039.8 ft³                                                                                                                           |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Total:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                                                     | 850.6 m³                                                                                                                               |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| WINTER NATURAL AIR CHANGE RATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.377             |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| SUMMER NATURAL AIR CHANGE RATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.118             |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Design Temperature Difference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Tin °C            | Tout °C                                             | ΔT °C                                                                                                                                  | ΔT °F                                                     |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Winter DTDh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 22                | -21                                                 | 43                                                                                                                                     | 78                                                        |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Summer DTDc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 24                | 31                                                  | 7                                                                                                                                      | 13                                                        |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>5.2.3.1 Heat Loss due to Air Leakage</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                                                     | <b>6.2.6 Sensible Gain due to Air Leakage</b>                                                                                          |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| $HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ <p>0.377 x 236.29 x 43 °C x 1.2 = 4622 W</p> <p>= 15770 Btu/h</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                                                     | $HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p>= 0.118 x 236.29 x 7 °C x 1.2 = 237 W</p> <p>= 809 Btu/h</p> |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>5.2.3.2 Heat Loss due to Mechanical Ventilation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                                                     | <b>6.2.7 Sensible heat Gain due to Ventilation</b>                                                                                     |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| $HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                                                     | $HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h</p>                             |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <b>5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| $HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairve Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL<sub>clevel</sub>)</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)</th> </tr> </thead> <tbody> <tr><td>1</td><td>0.5</td><td rowspan="5" style="text-align: center;">15,770</td><td>6,953</td><td>1.134</td></tr> <tr><td>2</td><td>0.3</td><td>10,237</td><td>0.462</td></tr> <tr><td>3</td><td>0.2</td><td>11,609</td><td>0.272</td></tr> <tr><td>4</td><td>0</td><td>0</td><td>0.000</td></tr> <tr><td>5</td><td>0</td><td>0</td><td>0.000</td></tr> </tbody> </table> <p>*HLairbv = Air leakage heat loss + ventilation heat loss<br/> *For a balanced or supply only ventilation system HLairve = 0</p> |                   |                                                     |                                                                                                                                        |                                                           | Level             | Level Factor (LF) | HLairve Air Leakage + Ventilation Heat Loss (Btu/h) | Level Conductive Heat Loss: (HL <sub>clevel</sub> ) | Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel) | 1    | 0.5   | 15,770 | 6,953 | 1.134 | 2      | 0.3  | 10,237 | 0.462   | 3     | 0.2 | 11,609 | 0.272 | 4      | 0 | 0 | 0.000 | 5      | 0 | 0 | 0.000        |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Level Factor (LF) | HLairve Air Leakage + Ventilation Heat Loss (Btu/h) | Level Conductive Heat Loss: (HL <sub>clevel</sub> )                                                                                    | Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel) |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.5               | 15,770                                              | 6,953                                                                                                                                  | 1.134                                                     |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.3               |                                                     | 10,237                                                                                                                                 | 0.462                                                     |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.2               |                                                     | 11,609                                                                                                                                 | 0.272                                                     |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 |                                                     | 0                                                                                                                                      | 0.000                                                     |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0                 |                                                     | 0                                                                                                                                      | 0.000                                                     |                   |                   |                                                     |                                                     |                                                           |      |       |        |       |       |        |      |        |         |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |

Michael O'Rourke  
BCIN# 19669


## HEAT LOSS AND GAIN SUMMARY SHEET

|               |         |            |        |                 |                 |
|---------------|---------|------------|--------|-----------------|-----------------|
| <b>MODEL:</b> | VILLA 1 | <b>WOB</b> |        | <b>BUILDER:</b> | GREENPARK HOMES |
| <b>SFQT:</b>  | 2258    | <b>LO#</b> | 102631 | <b>SITE:</b>    | TRINIGROUP      |

### DESIGN ASSUMPTIONS

|                      |    |                                |      |
|----------------------|----|--------------------------------|------|
| HEATING              | °F | COOLING                        | °F   |
| OUTDOOR DESIGN TEMP. | -6 | OUTDOOR DESIGN TEMP.           | 88   |
| INDOOR DESIGN TEMP.  | 72 | INDOOR DESIGN TEMP. (MAX 75°F) | 75   |
|                      |    | WINDOW SHGC                    | 0.50 |

### 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):                 | 30039.8         | 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:        | 5.5 ft   |
| LENGTH: 49.0 ft                     | WIDTH: 28.0 ft  | EXPOSED PERIMETER:        | 116.0 ft |
| WOB INSULATION CONFIGURATION        | SCB_9           | WOB EXPOSED PERIMETER     | 38.0 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                                       | 96%   | -     |
| HRV/ERV Minimum Efficiency                                                 | 75%   | -     |
| Domestic Hot Water Heater Minimum EF                                       | 0.8   | -     |

INDIVIDUAL BCIN: 19669  
MICHAEL O'ROURKE



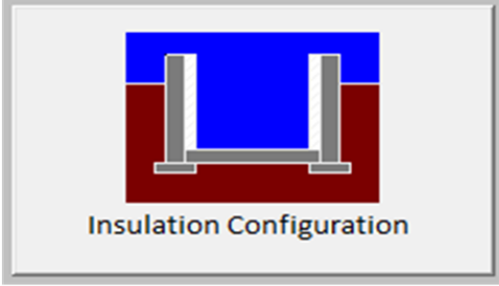
CITY OF RICHMOND HILL  
BUILDING DIVISION

05/01/2024

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Per: joshua.nabua

# Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

| Weather Station Description    |                                           |                                                                                                                 |
|--------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Province:                      | Ontario                                   |                                                                                                                 |
| Region:                        | Richmond Hill                             |                                                                                                                 |
| Site Description               |                                           |                                                                                                                 |
| Soil Conductivity:             | Normal conductivity: dry sand, loam, clay |                                                                                                                 |
| Water Table:                   | Normal (7-10 m, 23-33 ft)                 |                                                                                                                 |
| Foundation Dimensions          |                                           |                                                                                                                 |
| Floor Length (m):              | 4.6                                       | <br>Insulation Configuration |
| Floor Width (m):               | 8.5                                       |                                                                                                                 |
| Exposed Perimeter (m):         | 35.4                                      |                                                                                                                 |
| Wall Height (m):               | 2.6                                       |                                                                                                                 |
| Depth Below Grade (m):         | 1.39                                      |                                                                                                                 |
| Window Area (m <sup>2</sup> ): | 0.6                                       |                                                                                                                 |
| Door Area (m <sup>2</sup> ):   | 2.0                                       |                                                                                                                 |
| Radiant Slab                   |                                           |                                                                                                                 |
| Heated Fraction of the Slab:   | 0                                         |                                                                                                                 |
| Fluid Temperature (°C):        | 33                                        |                                                                                                                 |
| Design Months                  |                                           |                                                                                                                 |
| Heating Month                  | 1                                         |                                                                                                                 |
| Foundation Loads               |                                           |                                                                                                                 |
| Heating Load (Watts):          |                                           | 637                                                                                                             |

TYPE: VILLA 1  
LO# 102631

WOB

Michael O'Rourke BCIN #19669

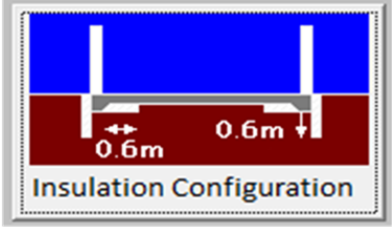
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BUILDING DIVISION

05/01/2024

  
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Per: joshua.nabua

## Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

| Weather Station Description  |                                           |                                                                                     |
|------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------|
| Province:                    | Ontario                                   |                                                                                     |
| Region:                      | Richmond Hill                             |                                                                                     |
| Site Description             |                                           |                                                                                     |
| Soil Conductivity:           | Normal conductivity: dry sand, loam, clay |                                                                                     |
| Water Table:                 | Normal (7-10 m, 23-33 ft)                 |                                                                                     |
| Foundation Dimensions        |                                           |                                                                                     |
| Length (m):                  | 1.5                                       |  |
| Width (m):                   | 8.5                                       |                                                                                     |
| Exposed Perimeter (m):       | 11.6                                      |                                                                                     |
| Radiant Slab                 |                                           |                                                                                     |
| Heated Fraction of the Slab: | 0                                         |                                                                                     |
| Fluid Temperature (°C):      | 33                                        |                                                                                     |
| Design Months                |                                           |                                                                                     |
| Heating Month                | 1                                         |                                                                                     |
| Results                      |                                           |                                                                                     |
| Heating Load (Watts):        |                                           | 135                                                                                 |

TYPE: VILLA 1  
LO# 102631

WOB

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL  
BUILDING DIVISION

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# Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

| Weather Station Description       |                            |                        |    |    |
|-----------------------------------|----------------------------|------------------------|----|----|
| Province:                         | Ontario                    |                        |    |    |
| Region:                           | Richmond Hill              |                        |    |    |
| Weather Station Location:         | Open flat terrain, grass   |                        |    |    |
| Anemometer height (m):            | 10                         |                        |    |    |
| Local Shielding                   |                            |                        |    |    |
| Building Site:                    | Suburban, forest           |                        |    |    |
| Walls:                            | Heavy                      |                        |    |    |
| Flue:                             | Heavy                      |                        |    |    |
| Highest Ceiling Height (m):       | 8.44                       |                        |    |    |
| Building Configuration            |                            |                        |    |    |
| Type:                             | Detached                   |                        |    |    |
| Number of Stories:                | Two                        |                        |    |    |
| Foundation:                       | Full                       |                        |    |    |
| House Volume (m <sup>3</sup> ):   | 850.6                      |                        |    |    |
| Air Leakage/Ventilation           |                            |                        |    |    |
| Air Tightness Type:               | Present (1961-) (3.57 ACH) |                        |    |    |
| Custom BDT Data:                  | ELA @ 10 Pa.               | 1133.9 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): | <b>0.377</b>               |                        |    |    |
| Cooling Air Leakage Rate (ACH/H): | <b>0.118</b>               |                        |    |    |

TYPE: VILLA 1  
LO# 102631

WOB

Michael O'Rourke BCIN# 19669

CITY OF RICHMOND HILL  
BUILDING DIVISION

05/01/2024

  
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INSTALLATION TO COMPLY WITH THE LATEST ONTARIO BUILDING CODE. ALL SUPPLY BRANCH OUTLETS SHALL BE EQUIPPED WITH MANUAL BALANCING DAMPER. DUCTWORK WHICH PASSES THROUGH THE GARAGE OR UNHEATED SPACES SHALL BE ADEQUATELY INSULATED AND GAS-PROOFED

ALL S/A DIFFUSERS "4x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

SUPPLEMENTAL EXHAUST FAN (MINIMUM 100 CFM) DISCHARGING DIRECTLY TO THE EXTERIOR WILL BE PROVIDED IN THE KITCHEN. EXHAUST DUCTS SERVING THE KITCHEN SHALL NOT BE SMALLER THAN RECOMMENDED BY THE MANUFACTURER OF THE FANS AND MUST AT LEAST MEET O.B.C. STATED MINIMUMS.

- 1.Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).
- 2.Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2).
- 3.Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.
- 4.Penetration of Air Barrier System by ducts, wires, conduits or building materials shall be sealed as per OBC 2012, Div.B 9.25.3.3.(9) & (10).
- 5.Volume control dampers to all branches to be installed per OBC 2012, Div.B, 6.2.4.5.
- 6.Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

7. Combustion air supply shall be provided to the furnace and hot water tank.

- 8.HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

9. HRV duct connection shall be in compliance with OBC 2012 Div.B 9.32.3.6(3) & 9.32.3.4(7).

10. Supply air grill at finished basement shall be at low level. Return air grill for finished or unfinished basement shall be at low level. HRAI digest 2005, clause 7.7(3).

- 13.Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.
14. Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.
15. For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

