HVAC DESIGNS LTD.

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SITE NAME: LAMBERT'S LANE PH.2
BUILDER: GREENPARK HOMES
TYPE: PRESTON 3
GFA: 2920
DATE: Feb-19
LO# 81351
WINTER NATURAL AIR CHANGE RATE 0.242
SUMMER NATURAL AIR CHANGE RATE 0.079
HEAT LOSS ΔT °F. 74
HEAT GAIN ΔT °F. 11
CSA-F280-12
ENERGYSTAR

| ROOM USE | | | MBR | | | ENS | | | WIC | | | BED-2 | | | BED-3 | | | BED-4 | | | BATH | | | WIC-3 | | | WIC-2 | | | ENS-2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXP. WALL | | | 32 | | | 23 | | | 6 | | | 14 | | | 26 | | | 18 | | | 7 | | | 30 | | | 6 | | | 11 | | |
| CLG. HT. | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | | 8 | | |
| | FACTORS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRS.WALL AREA | LOSS | GAIN | 259 | | | 186 | | | 48 | | | 113 | | | 210 | | | 145 | | | 57 | | | 242 | | | 48 | | | 89 | | |
| GLAZING | | | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN |
| NORTH | 18.6 | 15.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 297 | 242 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 130 | 106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EAST | 18.6 | 40.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 557 | 1222 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SOUTH | 18.6 | 24.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 297 | 385 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WEST | 18.6 | 40.7 | 32 | 594 | 1303 | 15 | 278 | 611 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 130 | 285 |
| SKYLT. | 31.2 | 99.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DOORS | 24.7 | 3.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NET EXPOSED WALL | 3.5 | 0.5 | 227 | 797 | 118 | 171 | 601 | 89 | 48 | 171 | 25 | 97 | 342 | 51 | 180 | 634 | 94 | 129 | 455 | 68 | 50 | 174 | 26 | 242 | 853 | 126 | 48 | 171 | 25 | 82 | 288 | 43 |
| NET EXPOSED BSMT WALL ABOVE GR | 3.5 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EXPOSED CLG | 1.3 | 0.6 | 255 | 320 | 142 | 132 | 165 | 74 | 72 | 98 | 40 | 238 | 298 | 133 | 209 | 262 | 117 | 216 | 271 | 120 | 119 | 149 | 66 | 48 | 60 | 27 | 102 | 128 | 57 | 66 | 83 | 37 |
| NO ATTIC EXPOSED CLG | 2.7 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| EXPOSED FLOOR | 2.5 | 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 | 0 | 0 | 0 |
| BASEMENT/CRAWL HEAT LOSS | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | |
| SLAB ON GRADE HEAT LOSS | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | |
| SUBTOTAL HT LOSS | | | 1710 | | | 1045 | | | 261 | | | 937 | | | 1972 | | | 1023 | | | 760 | | | 973 | | | 298 | | | 501 | | |
| SUB TOTAL HT GAIN | | | | | 1563 | | | 773 | | | 65 | | | 426 | | | 1589 | | | 573 | | | 242 | | | 182 | | | 82 | | | 240 |
| LEVEL FACTOR / MULTIPLIER | | | 0.20 | 0.25 | | 0.20 | 0.25 | | 0.20 | 0.25 | | 0.20 | 0.25 | | 0.20 | 0.25 | | 0.20 | 0.25 | | 0.20 | 0.25 | | 0.20 | 0.25 | | 0.20 | 0.25 | | 0.20 | 0.25 | |
| AIR CHANGE HEAT LOSS | | | 428 | | | 261 | | | 65 | | | 234 | | | 493 | | | 256 | | | 188 | | | 243 | | | 75 | | | 125 | | |
| AIR CHANGE HEAT GAIN | | | | | 82 | | | 41 | | | 3 | | | 22 | | | 79 | | | 30 | | | 13 | | | 9 | | | 4 | | | 13 |
| DUCT LOSS | | | 0 | | | 0 | | | 0 | | | 0 | | | 247 | | | 0 | | | 94 | | | 122 | | | 0 | | | 0 | | |
| DUCT GAIN | | | | | 0 | | | 0 | | | 0 | | | 0 | | | 232 | | | 0 | | | 25 | | | 17 | | | 0 | | | 0 |
| HEAT GAIN PEOPLE | 240 | | 2 | | 480 | 0 | | 0 | 0 | | 0 | 1 | | 240 | 1 | | 240 | 1 | | 240 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| HEAT GAIN APPLIANCES/LIGHTS | | | | | 489 | | | 0 | | | 0 | | | 489 | | | 489 | | | 489 | | | 0 | | | 0 | | | 0 | | | 0 |
| TOTAL HT LOSS BTU/H | | | 2138 | | | 1306 | | | 326 | | | 1171 | | | 2712 | | | 1279 | | | 1031 | | | 1338 | | | 373 | | | 626 | | |
| TOTAL HT GAIN x 1.3 BTU/H | | | | | 3358 | | | 1068 | | | 90 | | | 1530 | | | 3314 | | | 1731 | | | 364 | | | 244 | | | 112 | | | 339 |

| ROOM USE | | | LIBR | | | LV/DN | | | KIT | | | FAM | | | LAUN | | | WR | | | FOY | | | MUD | | | | | | | | | WOD | | | BAS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXP. WALL | | | 10 | | | 18 | | | 36 | | | 35 | | | 0 | | | 9 | | | 46 | | | 24 | | | | | | | | | 19 | | | 180 | | |
| CLG. HT. | | | 10 | | | 10 | | | 10 | | | 10 | | | 8 | | | 10 | | | 10 | | | 10 | | | | | | | | | 9 | | | 9 | | |
| | FACTORS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRS.WALL AREA | LOSS | GAIN | 100 | | | 180 | | | 360 | | | 360 | | | 0 | | | 90 | | | 460 | | | 240 | | | | | | | | | 162 | | | 1047 | | |
| GLAZING | | | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | LOSS | | GAIN | | | | | | LOSS | | GAIN | LOSS | | GAIN |
| NORTH | 18.6 | 15.1 | 20 | 371 | 303 | 0 | 0 | 0 | 9 | 167 | 136 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 4 | 74 | 61 |
| EAST | 18.6 | 40.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 1076 | 2352 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| SOUTH | 18.6 | 24.1 | 0 | 0 | 0 | 40 | 742 | 963 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 167 | 217 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 4 | 74 | 96 |
| WEST | 18.6 | 40.7 | 0 | 0 | 0 | 0 | 0 | 0 | 66 | 1224 | 2687 | 24 | 445 | 977 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 12 | 223 | 489 |
| SKYLT. | 31.2 | 99.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| DOORS | 24.7 | 3.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| NET EXPOSED WALL | 3.5 | 0.5 | 80 | 281 | 42 | 140 | 492 | 73 | 285 | 1002 | 149 | 336 | 1182 | 175 | 0 | 0 | 0 | 81 | 285 | 42 | 382 | 1273 | 189 | 220 | 774 | 115 | | | | | | 0 | 0 | 0 | 20 | 493 | 73 |
| NET EXPOSED BSMT WALL ABOVE GR | 3.5 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| EXPOSED CLG | 1.3 | 0.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 84 | 105 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 114 | 401 | 59 | 483 | 1697 | 252 |
| NO ATTIC EXPOSED CLG | 2.7 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 27 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 82 | 103 | 46 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| EXPOSED FLOOR | 2.5 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 129 | 57 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| BASEMENT/CRAWL HEAT LOSS | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| SLAB ON GRADE HEAT LOSS | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | | | | | | | | | | 6255 | | |
| SUBTOTAL HT LOSS | | | 652 | | | 1234 | | | 2393 | | | 1664 | | | 105 | | | 452 | | | 3566 | | | 1267 | | | | | | | | | 0 | | | | | |
| SUB TOTAL HT GAIN | | | | | 345 | | | 1036 | | | 2972 | | | 1164 | | | 47 | | | 259 | | | 2799 | | | 188 | | | | | | 401 | | | 8815 | | |
| LEVEL FACTOR / MULTIPLIER | | | 0.30 | 0.32 | | 0.30 | 0.32 | | 0.30 | 0.32 | | 0.30 | 0.32 | | 0.20 | 0.25 | | 0.30 | 0.32 | | 0.30 | 0.32 | | 0.30 | 0.32 | | | | | | | | 59 | | | 970 | | |
| AIR CHANGE HEAT LOSS | | | 209 | | | 395 | | | 756 | | | 529 | | | 26 | | | 145 | | | 1142 | | | 406 | | | | | | | | | | | | 0.50 | 0.65 | | |
| AIR CHANGE HEAT GAIN | | | | | 18 | | | 54 | | | 158 | | | 61 | | | 2 | | | 14 | | | 147 | | | 10 | | | | | | | | | | 5987 | | |
| DUCT LOSS | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | | | | | | | | | | | | 54 |
| DUCT GAIN | | | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | 0 | | | | | | | | | | | | | | 0 | |
| HEAT GAIN PEOPLE | 240 | | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | | | | | | | | | | | 0 | |
| HEAT GAIN APPLIANCES/LIGHTS | | | | | 489 | | | 489 | | | 489 | | | 489 | | | 489 | | | 0 | | | 0 | | | 489 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | |
| TOTAL HT LOSS BTU/H | | | 861 | | | 1630 | | | 3160 | | | 2183 | | | 132 | | | 596 | | | 4708 | | | 1672 | | | | | | | | | 401 | | | 14802 | | |
| TOTAL HT GAIN x 1.3 BTU/H | | | | | 1107 | | | 2052 | | | 4702 | | | 2229 | | | 700 | | | 364 | | | 3830 | | | 892 | | | | | | | | 77 | | | 1967 | |

TOTAL HEAT GAIN BTU/H: 30328 TONS: 2.53 LOSS DUE TO VENTILATION LOAD BTU/H: 1593 STRUCTURAL HEAT LOSS: 42444 TOTAL COMBINED HEAT LOSS BTU/H: 44037

THIS STRUCTURE MUST BE CONSTRUCTED TO MEET OR EXCEED THE PROVISIONS OF THE ONTARIO BUILDING CODE



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

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SITE NAME: LAMBERT'S LANE PH.2
BUILDER: GREENPARK HOMES

TYPE: PRESTON 3 DATE: Feb-19 GFA: 2920 LO# 81351

| | | | |
|---|---|---|---|
| HEATING CFM | 1131 | COOLING CFM | 1131 |
| TOTAL HEAT LOSS | 42,444 | TOTAL HEAT GAIN | 30,092 |
| AIR FLOW RATE CFM | 26.65 | AIR FLOW RATE CFM | 37.58 |

| | | | |
|---|---|---|---|
| furnace pressure | 0.6 | | |
| furnace filter | 0.05 | | |
| a/c coil pressure | 0.2 | | |
| available pressure for s/a & r/a | 0.35 | | |
| plenum pressure s/a | 0.18 | r/a pressure | 0.17 |
| max s/a dif press. loss | 0.02 | r/a grille press. Loss | 0.02 |
| min adjusted pressure s/a | 0.16 | adjusted pressure r/a | 0.15 |

#GOODMAN
GMEC960603BNA 60
FAN SPEED
LOW
MEDLOW
MEDIUM
MEDIUM HIGH
HIGH 1131

AFUE = 96 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 57,600

DESIGN CFM = 1131
CFM @ .5 " E.S.P.

TEMPERATURE RISE 47 °F

| RUN COUNT | 4th | 3rd | 2nd | 1st | Bas |
|---|---|---|---|---|---|
| S/A | 0 | 0 | 13 | 9 | 4 |
| R/A | 0 | 0 | 4 | 3 | 1 |

All S/A diffusers 4"x10" unless noted otherwise on layout.
All S/A runs 5"Ø unless noted otherwise on layout.

| RUN # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROOM NAME | MBR | ENS | WIC | BED-2 | BED-3 | BED-4 | BATH | WIC-3 | WIC-2 | MBR | ENS-2 | LIBR | LV/DN | KIT | KIT | FAM | LAUN | W/R | FOY | MUD | BAS | BAS | BAS | BAS |
| RM LOSS MBH. | 1.07 | 1.31 | 0.33 | 1.17 | 1.36 | 1.28 | 1.03 | 1.34 | 0.37 | 1.07 | 0.63 | 0.86 | 1.63 | 1.58 | 1.58 | 2.18 | 0.13 | 0.60 | 2.35 | 1.67 | 3.80 | 3.80 | 3.80 | 3.80 |
| CFM PER RUN HEAT | 28 | 35 | 9 | 31 | 36 | 34 | 27 | 36 | 10 | 28 | 17 | 23 | 43 | 42 | 42 | 58 | 4 | 16 | 63 | 45 | 101 | 101 | 101 | 101 |
| RM GAIN MBH. | 1.70 | 1.06 | 0.09 | 1.53 | 1.66 | 1.73 | 0.36 | 0.24 | 0.11 | 1.70 | 0.34 | 1.11 | 2.05 | 2.35 | 2.35 | 2.23 | 0.70 | 0.35 | 1.92 | 0.89 | 0.51 | 0.51 | 0.51 | 0.51 |
| CFM PER RUN COOLING | 64 | 40 | 3 | 57 | 62 | 65 | 14 | 9 | 4 | 64 | 13 | 42 | 77 | 88 | 88 | 84 | 26 | 13 | 72 | 34 | 19 | 19 | 19 | 19 |
| ADJUSTED PRESSURE | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 |
| ACTUAL DUCT LGH. | 55 | 54 | 42 | 43 | 38 | 36 | 35 | 38 | 52 | 71 | 41 | 38 | 33 | 41 | 52 | 44 | 45 | 26 | 31 | 26 | 50 | 40 | 23 | 32 |
| EQUIVALENT LENGTH | 150 | 180 | 170 | 160 | 190 | 190 | 190 | 150 | 170 | 190 | 170 | 210 | 190 | 190 | 200 | 190 | 170 | 160 | 140 | 160 | 190 | 140 | 150 | 160 |
| TOTAL EFFECTIVE LENGTH | 205 | 234 | 212 | 203 | 228 | 226 | 225 | 188 | 222 | 261 | 211 | 248 | 223 | 231 | 252 | 234 | 215 | 186 | 171 | 186 | 240 | 180 | 173 | 192 |
| ADJUSTED PRESSURE | 0.08 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.08 | 0.07 | 0.08 | 0.07 | 0.08 | 0.07 | 0.08 | 0.07 | 0.08 | 0.09 | 0.1 | 0.09 | 0.07 | 0.09 | 0.09 | 0.08 |
| ROUND DUCT SIZE | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 6 | 6 | 6 | 6 | 4 | 4 | 5 | 4 | 6 | 6 | 6 | 6 |
| HEATING VELOCITY (ft/min) | 206 | 257 | 103 | 228 | 264 | 250 | 310 | 413 | 115 | 206 | 195 | 169 | 219 | 214 | 214 | 296 | 46 | 184 | 463 | 516 | 515 | 515 | 515 | 515 |
| COOLING VELOCITY (ft/min) | 470 | 294 | 34 | 419 | 455 | 477 | 161 | 103 | 46 | 470 | 149 | 308 | 393 | 449 | 449 | 428 | 298 | 149 | 529 | 390 | 97 | 97 | 97 | 97 |
| OUTLET GRILL SIZE | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 3X10 | 4X10 | 4X10 | 4X10 | 4X10 | 3X10 | 3X10 | 3X10 | 3X10 | 4X10 | 4X10 | 4X10 | 4X10 |
| TRUNK | A | B | B | C | E | E | E | E | B | B | C | B | C | A | A | A | B | E | D | C | A | B | C | D |

| RUN # | 26 | 27 |
|---|---|---|
| ROOM NAME | BED-3 | FOY |
| RM LOSS MBH. | 1.36 | 2.35 |
| CFM PER RUN HEAT | 36 | 63 |
| RM GAIN MBH. | 1.66 | 1.92 |
| CFM PER RUN COOLING | 62 | 72 |
| ADJUSTED PRESSURE | 0.17 | 0.17 |
| ACTUAL DUCT LGH. | 44 | 21 |
| EQUIVALENT LENGTH | 170 | 160 |
| TOTAL EFFECTIVE LENGTH | 214 | 181 |
| ADJUSTED PRESSURE | 0.08 | 0.1 |
| ROUND DUCT SIZE | 5 | 5 |
| HEATING VELOCITY (ft/min) | 264 | 463 |
| COOLING VELOCITY (ft/min) | 455 | 529 |
| OUTLET GRILL SIZE | 3X10 | 3X10 |
| TRUNK | E | D |

THIS SYSTEM MUST BE CONSTRUCTED TO MEET OR EXCEED THE PROVISIONS OF THE ONTARIO BUILDING CODE

SUPPLY AIR TRUNK SIZE

| | TRUNK CFM | STATIC PRESS. | ROUND DUCT | RECT DUCT | | | VELOCITY (ft/min) | | TRUNK CFM | STATIC PRESS. | ROUND DUCT | RECT DUCT | | | VELOCITY (ft/min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRUNK A | 271 | 0.06 | 9.2 | 12 | x | 8 | 407 | TRUNK G | 0 | 0.00 | 0 | 0 | x | 8 | 0 |
| TRUNK B | 481 | 0.06 | 11.5 | 18 | x | 8 | 481 | TRUNK H | 0 | 0.00 | 0 | 0 | x | 8 | 0 |
| TRUNK C | 718 | 0.06 | 13.3 | 22 | x | 8 | 587 | TRUNK I | 0 | 0.00 | 0 | 0 | x | 8 | 0 |
| TRUNK D | 227 | 0.08 | 8 | 8 | x | 8 | 511 | TRUNK J | 0 | 0.00 | 0 | 0 | x | 8 | 0 |
| TRUNK E | 412 | 0.08 | 10.1 | 12 | x | 8 | 618 | TRUNK K | 0 | 0.00 | 0 | 0 | x | 8 | 0 |
| TRUNK F | 1130 | 0.06 | 15.8 | 28 | x | 8 | 726 | TRUNK L | 0 | 0.00 | 0 | 0 | x | 8 | 0 |

RETURN AIR TRUNK SIZE

| | TRUNK CFM | STATIC PRESS. | ROUND DUCT | RECT DUCT | | | VELOCITY (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 | 1131 | 0.05 | 16.5 | 32 | x | 8 | 636 |
| TRUNK Y | 560 | 0.05 | 12.7 | 18 | x | 8 | 560 |
| TRUNK Z | 0 | 0.05 | 0 | 0 | x | 8 | 0 |
| DROP | 1131 | 0.05 | 16.5 | 24 | x | 10 | 679 |

| RETURN AIR # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | | | | | BR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| AIR VOLUME | 115 | 155 | 95 | 125 | 135 | 155 | 155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| PLENUM PRESSURE | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 196 |
| ACTUAL DUCT LGH. | 76 | 45 | 44 | 52 | 40 | 43 | 18 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.15 |
| EQUIVALENT LENGTH | 245 | 185 | 135 | 175 | 250 | 225 | 180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| TOTAL EFFECTIVE LH | 321 | 230 | 179 | 227 | 290 | 268 | 198 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 135 |
| ADJUSTED PRESSURE | 0.05 | 0.06 | 0.08 | 0.07 | 0.05 | 0.06 | 0.07 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 149 |
| ROUND DUCT SIZE | 7 | 7.5 | 5.8 | 6.7 | 7.5 | 7.5 | 7.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.10 |
| INLET GRILL SIZE | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.2 |
| | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 8 |
| INLET GRILL SIZE | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X |
| | | | | | | | | | | | | | | | | 14 |

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.

Michael O'Rourke - INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: PRESTON 3 LO # 81351
SITE NAME: LAMBERT'S LANE PH.2

# RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

**COMBUSTION APPLIANCES** 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

**HEATING SYSTEM**

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

**HOUSE TYPE** 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

**SYSTEM DESIGN OPTIONS** O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

**TOTAL VENTILATION CAPACITY** 9.32.3.3(1)

| | | | | |
|---|---|---|---|---|
| Basement + Master Bedroom | 2 | @ 21.2 cfm | 42.4 | cfm |
| Other Bedrooms | 3 | @ 10.6 cfm | 31.8 | cfm |
| Kitchen & Bathrooms | 5 | @ 10.6 cfm | 53 | cfm |
| Other Rooms | 7 | @ 10.6 cfm | 74.2 | cfm |
| Table 9.32.3.A. | | TOTAL | 201.4 | 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** 9.32.3.6.

| | | |
|---|---|---|
| Total Ventilation Capacity | 201.4 | cfm |
| Less Principal Ventil. Capacity | 79.5 | cfm |
| Required Supplemental Capacity | 121.9 | cfm |

**PRINCIPAL EXHAUST FAN CAPACITY**

Model: VANEE 65H Location: BSMT

79.5 cfm 3.0 sones [✓] HVI Approved

**PRINCIPAL EXHAUST HEAT LOSS CALCULATION**

| CFM | | ΔT °F | | FACTOR | | % LOSS |
|---|---|---|---|---|---|---|
| 79.5 CFM | X | 74 F | X | 1.08 | X | 0.25 |

**SUPPLEMENTAL FANS** PANASONIC

| Location | Model | cfm | HVI | Sones |
|---|---|---|---|---|
| ENS | FV-05-11VK1 | 50 | ✓ | 0.3 |
| BATH | FV-05-11VK1 | 50 | ✓ | 0.3 |
| ENS-2 | FV-05-11VK1 | 50 | ✓ | 0.3 |
| W/R | FV-05-11VK1 | 50 | ✓ | 0.3 |

**HEAT RECOVERY VENTILATOR** 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % Sensible Efficiency @ 32 deg F ( 0 deg C) [✓] HVI Approved

**LOCATION OF INSTALLATION**

Lot: Concession

Township Plan:

Address

Roll # Building Permit #

**BUILDER:** GREENPARK HOMES

Name:

Address:

City:

Telephone #: Fax #:

**INSTALLING CONTRACTOR**

Name:

Address:

City:

Telephone #: Fax #:

**DESIGNER CERTIFICATION**

I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.

Name: HVAC Designs Ltd.

Signature: Michael O'Rourke

HRAI # 001820

Date: February-19

I REVIEW AND TAKE RESPONIBILITY 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: 19569 Michael O'Rourke MICHAEL O'ROURKE

THIS [illegible] CONSTRUCTED TO MEET OR EXCEED THE PROVISIONS OF THE ONTARIO BUILDING CODE

HVAC DESIGNS LTD.

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# CSA F280-12 Residential Heat Loss and Heat Gain Calculations

## Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 81351 Model: PRESTON 3 Builder: GREENPARK HOMES Date: 2/4/2019

### Volume Calculation

**House Volume**

| Level | Floor Area ($ft^2$) | Floor Height (ft) | Volume ($ft^3$) |
|---|---|---|---|
| Bsmt | 1314 | 9 | 11169 |
| First | 1314 | 10 | 13140 |
| Second | 1606 | 8 | 12981.298 |
| Third | 0 | 9 | 0 |
| Fourth | 0 | 9 | 0 |
| | | Total: | 37,290.3 $ft^3$ |
| | | Total: | 1055.9 $m^3$ |

### Air Change & Delta T Data

| | |
|---|---|
| WINTER NATURAL AIR CHANGE RATE | 0.242 |
| SUMMER NATURAL AIR CHANGE RATE | 0.079 |

**Design Temperature Difference**

| | Tin °C | Tout °C | ΔT °C | ΔT °F |
|---|---|---|---|---|
| Winter DTDh | 22 | -19 | 41 | 74 |
| Summer DTDc | 24 | 30 | 6 | 11 |

### 5.2.3.1 Heat Loss due to Air Leakage

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

0.242 x 293.32 x 41 °C x 1.2 = 3509 W

= 11974 Btu/h

### 6.2.6 Sensible Gain due to Air Leakage

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

= 0.079 x 293.32 x 6 °C x 1.2 = 169 W

= 577 Btu/h

### 5.2.3.2 Heat Loss due to Mechanical Ventilation

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

80 CFM x 74 °F x 1.08 x 0.25 = 1593 Btu/h

### 6.2.7 Sensible heat Gain due to Ventilation

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

80 CFM x 11 °F x 1.08 x 0.25 = 236 Btu/h

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

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

| Level | Level Factor (LF) | HLairve Air Leakage + Ventilation Heat Loss (Btu/h) | Level Conductive Heat Loss: ($HL_{clevel}$) | Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel) |
|---|---|---|---|---|
| 1 | 0.5 | 11,974 | 9,216 | 0.650 |
| 2 | 0.3 | | 11,218 | 0.320 |
| 3 | 0.2 | | 9,469 | 0.253 |
| 4 | 0 | | 0 | 0.000 |
| 5 | 0 | | 0 | 0.000 |

*HLairbv = Air leakage heat loss + ventilation heat loss
*For a balanced or supply only ventilation system HLairve = 0

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# HEAT LOSS AND GAIN SUMMARY SHEET

**MODEL:** PRESTON 3 **BUILDER:** GREENPARK HOMES
**SFQT:** 2920 **LO#** 81351 **SITE:** LAMBERT'S LANE PH.2

## DESIGN ASSUMPTIONS

| | | | |
|---|---|---|---|
| HEATING | °F | COOLING | °F |
| OUTDOOR DESIGN TEMP. | -2 | OUTDOOR DESIGN TEMP. | 86 |
| INDOOR DESIGN TEMP. | 72 | INDOOR DESIGN TEMP. (MAX 75°F) | 75 |

## BUILDING DATA

| | | | |
|---|---|---|---|
| ATTACHMENT: | DETACHED | # OF STORIES (+BASEMENT): | 3 |
| FRONT FACES: | EAST | ASSUMED (Y/N): | Y |
| AIR CHANGES PER HOUR: | 2.50 | ASSUMED (Y/N): | Y |
| AIR TIGHTNESS CATEGORY: | TIGHT | ASSUMED (Y/N): | Y |
| WIND EXPOSURE: | SHELTERED | ASSUMED (Y/N): | Y |
| HOUSE VOLUME ($ft^3$): | 37290.3 | ASSUMED (Y/N): | Y |
| INTERNAL SHADING: | BLINDS/CURTAINS | ASSUMED OCCUPANTS: | 5 |
| INTERIOR LIGHTING LOAD (Btu/h/$ft^2$): | 1.27 | DC BRUSHLESS MOTOR (Y/N): | Y |
| FOUNDATION CONFIGURATION | BCIN_1 | DEPTH BELOW GRADE: | 5.5 ft |
| LENGTH: 60.0 ft | WIDTH: 30.0 ft | EXPOSED PERIMETER: | 180.0 ft |

| 2012 OBC - COMPLIANCE PACKAGE<br>Component | Compliance Package ENERGYSTAR | |
|---|---|---|
| | Nominal | Min. Eff. |
| Ceiling with Attic Space Minimum RSI (R)-Value | 60 | 59.20 |
| Ceiling Without Attic Space Minimum RSI (R)-Value | 31 | 27.70 |
| Exposed Floor Minimum RSI (R)-Value | 31 | 29.80 |
| Walls Above Grade Minimum RSI (R)-Value | R22+R5 | 21.10 |
| Basement Walls Minimum RSI (R)-Value | 20 | 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 | ZONE 2 | - |
| Skylights Maximum U-Value | ZONE 2 | - |
| Space Heating Equipment Minimum AFUE | 0.96 | - |
| HRV Minimum Efficiency | 75% | - |
| Domestic Hot Water Heater Minimum EF | 0.9 | - |

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INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

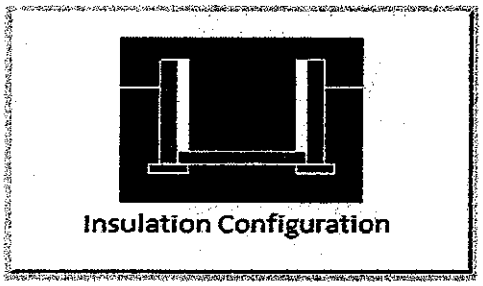
Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

# Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

| Weather Station Description | |
|---|---|
| Province: | Ontario |
| Region: | Brampton |
| **Site Description** | |
| Soil Conductivity: | Normal conductivity: dry sand, loam, clay |
| Water Table: | Normal (7-10 m, 23-33 ft) |
| **Foundation Dimensions** | |
| Floor Length (m): | 18.3 |
| Floor Width (m): | 9.1 |
| Exposed Perimeter (m): | 0.0 |
| Wall Height (m): | 2.6 |
| Depth Below Grade (m): | 1.68 |
| Window Area ($m^2$): | 1.9 |
| Door Area ($m^2$): | 1.9 |
| **Radiant Slab** | |
| Heated Fraction of the Slab: | 0 |
| Fluid Temperature (°C): | 33 |
| **Design Months** | |
| **Heating Month** | 1 |
| **Foundation Loads** | |
| **Heating Load (Watts):** | **1833** |



Insulation Configuration

**TYPE:** PRESTON 3
**LO#** 81351

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

# Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

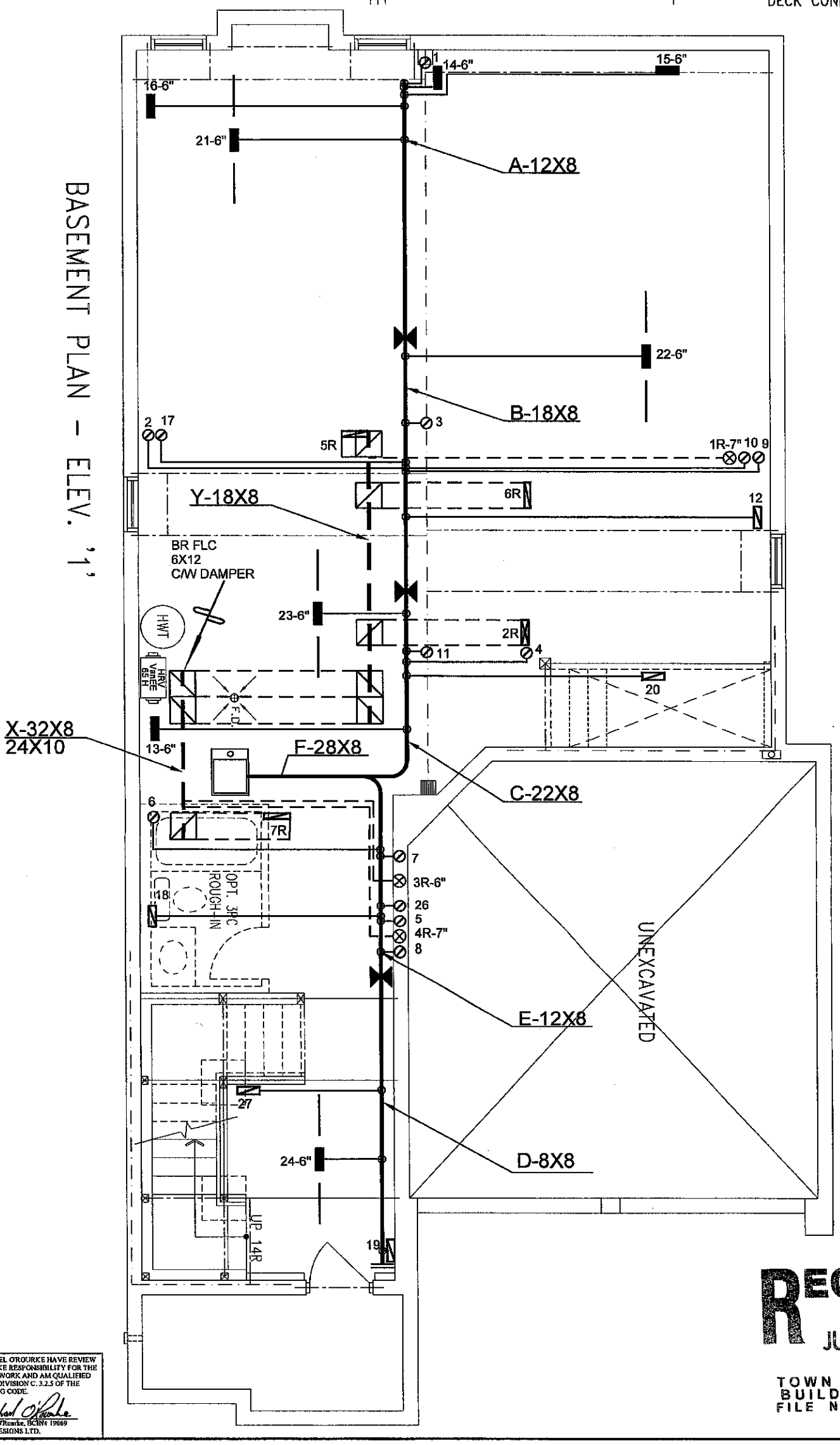
| Weather Station Description | |
|---|---|
| Province: | Ontario |
| Region: | Brampton |
| Weather Station Location: | Open flat terrain, grass |
| Anemometer height (m): | 10 |
| **Local Shielding** | |
| Building Site: | Suburban, forest |
| Walls: | Heavy |
| Flue: | Heavy |
| Highest Ceiling Height (m): | 7.34 |
| **Building Configuration** | |
| Type: | Detached |
| Number of Stories: | Two |
| Foundation: | Full |
| House Volume ($m^3$): | 1055.9 |
| **Air Leakage/Ventilation** | |
| Air Tightness Type: | Energy Star Detached (2.5 ACH) |
| Custom BDT Data: | ELA @ 10 Pa. 985.7 $cm^2$ |
| | 2.50 ACH @ 50 Pa |
| Mechanical Ventilation (L/s): | Total Supply 37.5 / Total Exhaust 37.5 |
| **Flue Size** | |
| Flue #: | #1 #2 #3 #4 |
| Diameter (mm): | 0 0 0 0 |
| **Natural Infiltration Rates** | |
| **Heating Air Leakage Rate (ACH/H):** | **0.242** |
| **Cooling Air Leakage Rate (ACH/H):** | **0.079** |

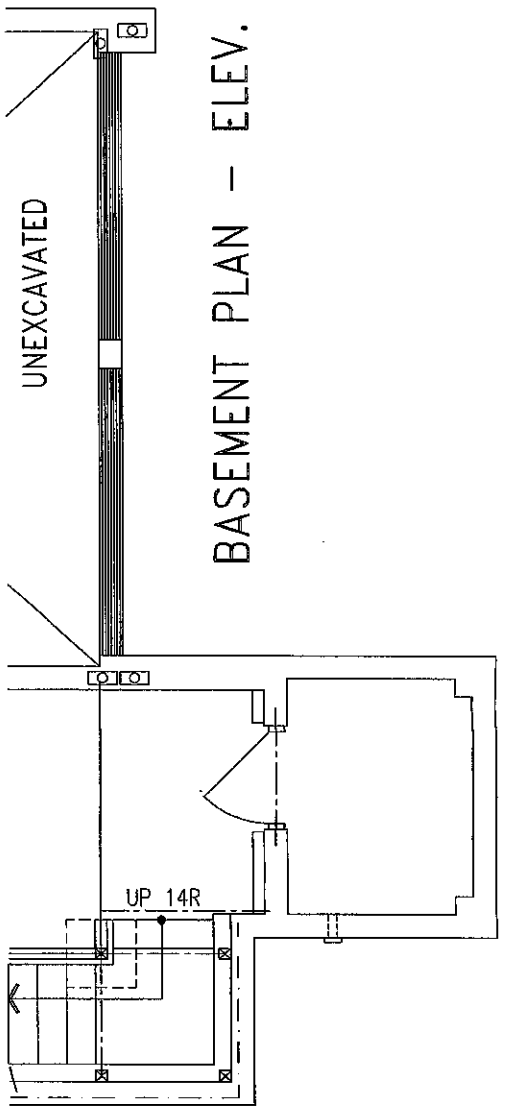
**TYPE:** PRESTON 3
**LO#** 81351

THIS STRUCTURE MUST BE CONSTRUCTED TO MEET OR EXCEED THE PROVISIONS O THE ONTARIO BUILDING COD

PARTIAL BASEMENT PLAN
DECK CONDITION

BASEMENT PLAN – ELEV. '1'

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MINIMUM CEILING HEIGHT SHALL BE 2100 MM OVER AT LEAST 75% OF BASEMENT AREA EXCEPT THAT UNDER BEAMS AND DUCTS THE CLEARANCE IS PERMITTED TO BE REDUCED 1950 M M

RECEIVED
JUN 13 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

CSA-F280-12
ENERGY STAR

I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C. 3.2.5 OF THE BUILDING CODE.
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

## HVAC LEGEND

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| — ▭ — | SUPPLY AIR GRILLE | ▬ | 6" SUPPLY AIR BOOT ABOVE | ▭ | 14"x8" RETURN AIR GRILLE | ▭ | RETURN AIR STACK ABOVE |
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| No. | Description | Date |
|---|---|---|
| 3. | | |
| 2. | | |
| 1. | | |

REVISIONS



Client
GREENPARK HOMES

Project Name
LAMBERTS LANE HOME CORP PH 2
CALEDON, ONTARIO

PRESTON 3 2920 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

| HEAT LOSS 44037 BTU/H | |
|---|---|
| UNIT DATA | |
| MAKE | GOODMAN |
| MODEL | GMEC960603BNA-60 |
| INPUT | 60 MBTU/H |
| OUTPUT | 57.6 MBTU/H |
| COOLING | 2.5 TONS |
| FAN SPEED | 1131 cfm @ 0.6" w.c. |

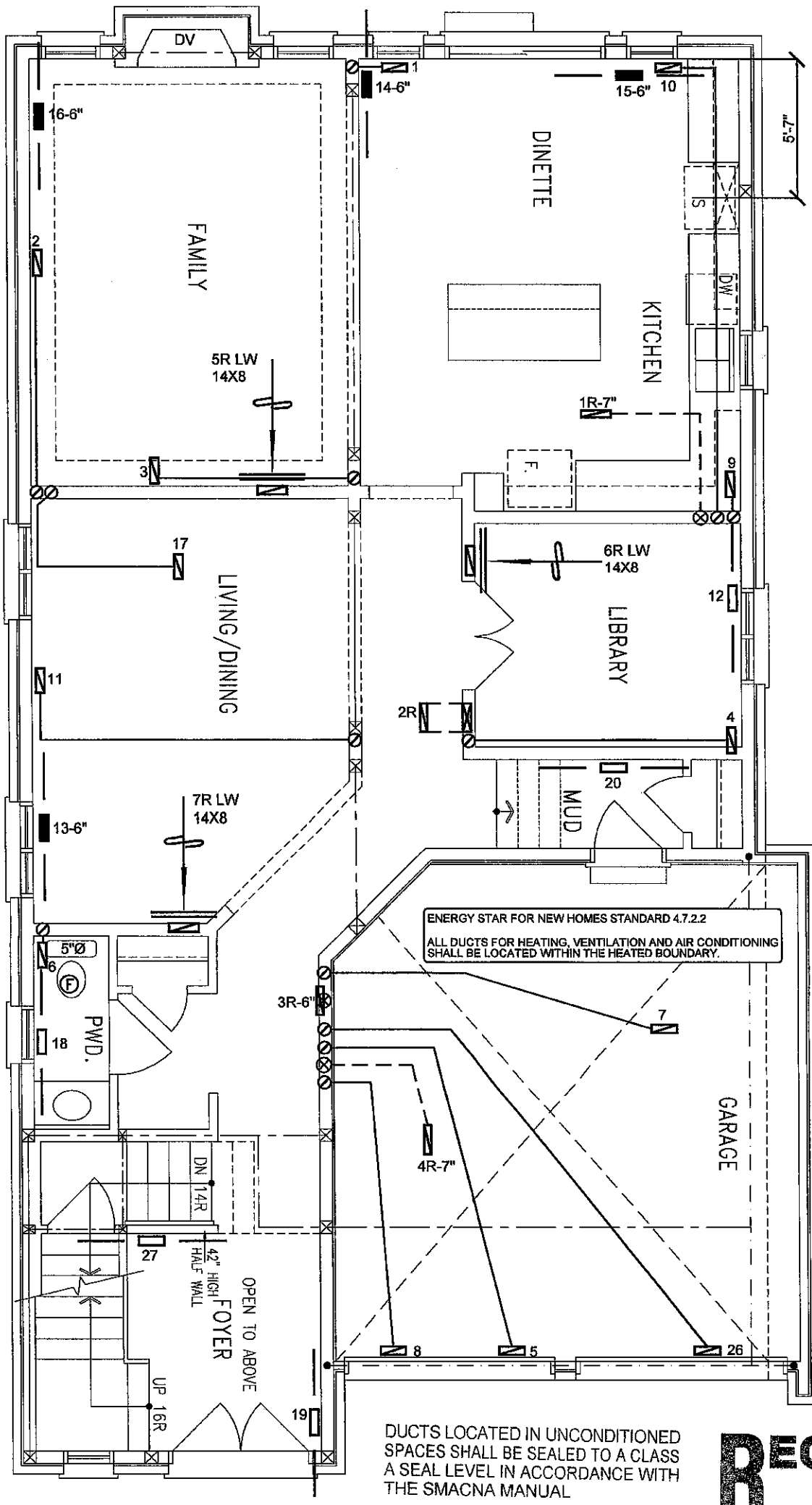
| # OF RUNS | S/A | R/A | FANS |
|---|---|---|---|
| 3RD FLOOR | | | |
| 2ND FLOOR | 13 | 4 | 4 |
| 1ST FLOOR | 9 | 3 | 2 |
| BASEMENT | 4 | 1 | 0 |

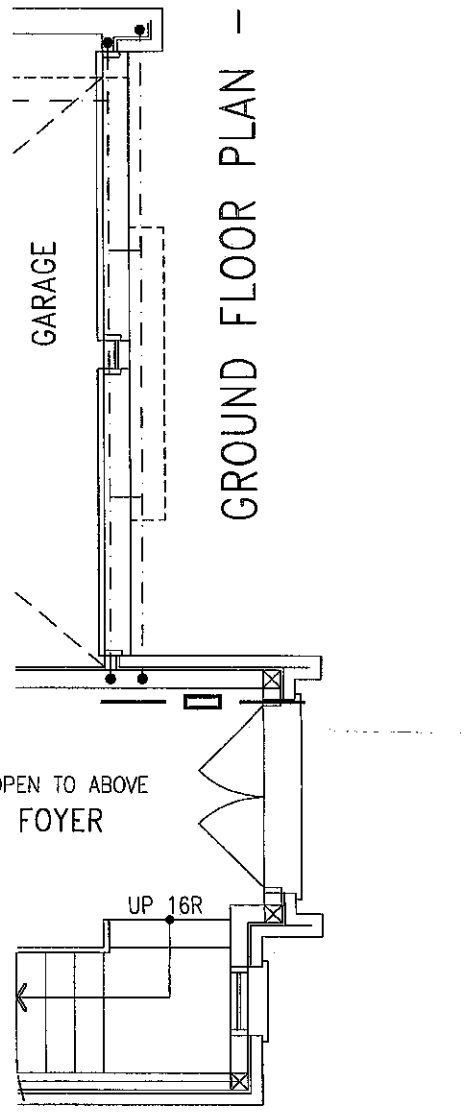
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

Date FEB/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 81351

# GROUND FLOOR PLAN - ELEV. '1'

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DUCTS LOCATED IN UNCONDITIONED SPACES SHALL BE SEALED TO A CLASS A SEAL LEVEL IN ACCORDANCE WITH THE SMACNA MANUAL

~~MINIMUM CEILING HEIGHT SHALL BE 2100 MM OVER AT LEAST 75% OF BASEMENT AREA EXCEPT THAT UNDER BEAMS AND DUCTS THE CLEARANCE IS PERMITTED TO BE REDUCED 1950 M M~~

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

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date FEB/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 81351

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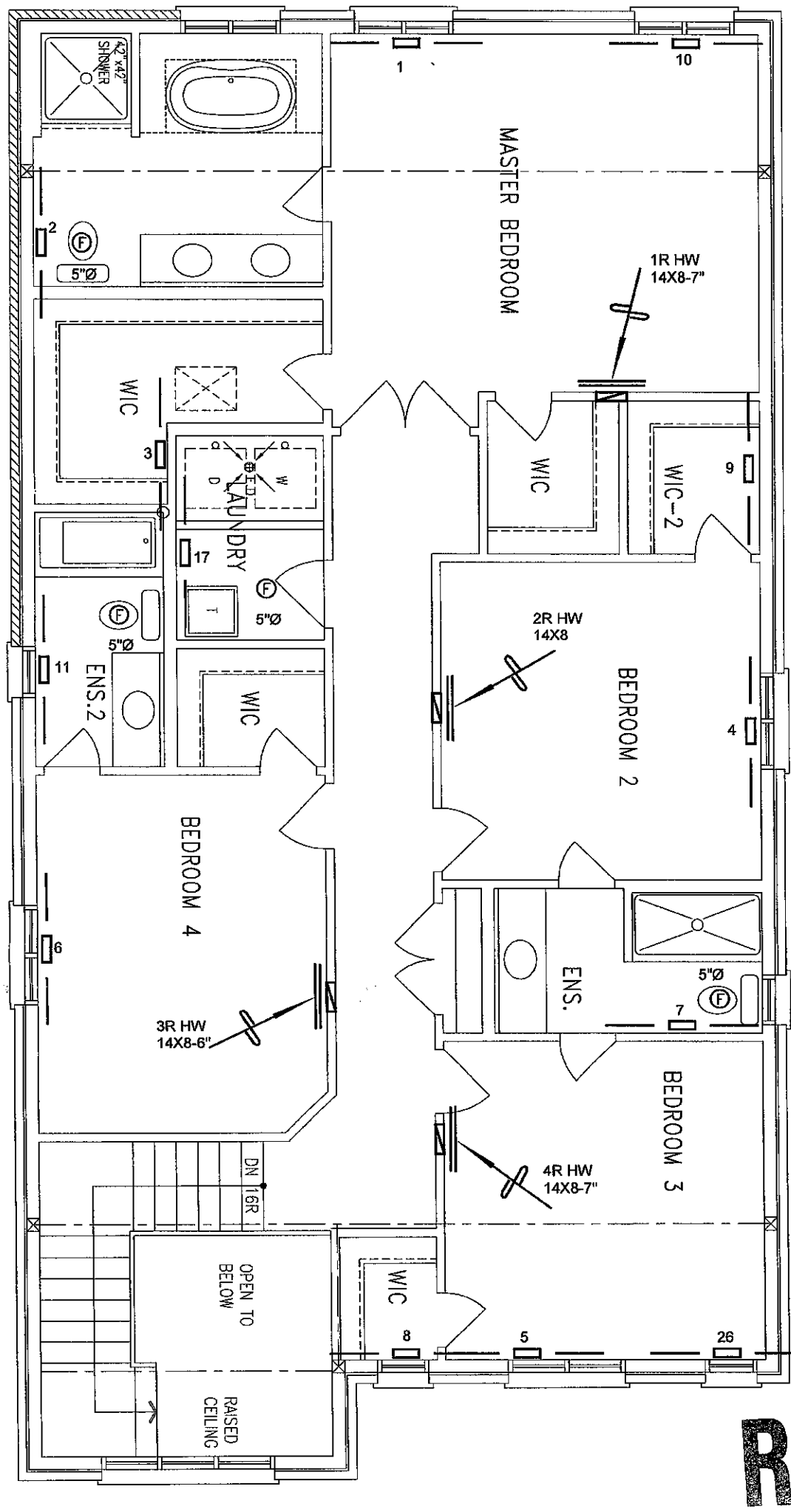
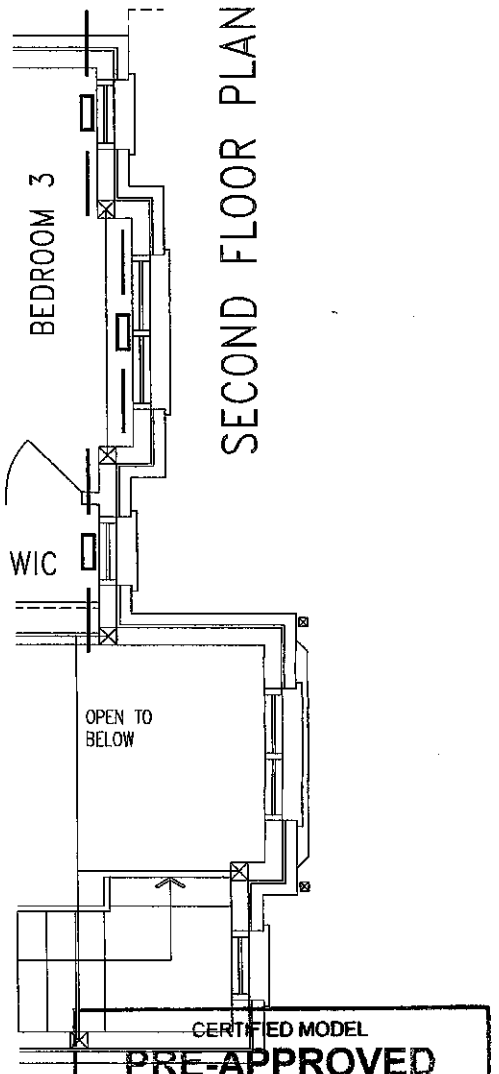
# SECOND FLOOR PLAN (4 BED) - ELEV. '1'




# SECOND FLOOR PLAN (4 BED) - ELEV. '2'




CERTIFIED MODEL
**PRE-APPROVED**
FOR PERMIT APPLICATION AS PER THE ONTARIO BUILDING CODE
TOWN OF CALEDON BUILDING DIVISION
REVIEWED BY [illegible]-SA
DATE July 25, 2019
FILE # CMOD- PRESTON3

(ELEVATION 12)

RECEIVED
JUN 13 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

CSA-F280-12

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SECOND FLOOR HEATING LAYOUT

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