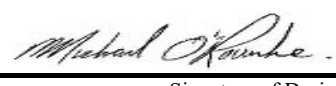


## Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                                                                                               |                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>A. Project Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                                                                                                               |                               |
| Building number, street name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              | Unit no.                                                                                                      | Lot/con.                      |
| Municipality<br>BRAMPTON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Postal code                  | Plan number/ other description                                                                                |                               |
| <b>B. Individual who reviews and takes responsibility for design activities</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                                                                                               |                               |
| Name<br>MICHAEL O'ROURKE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              | Firm<br>HVAC DESIGNS LTD.                                                                                     |                               |
| Street address<br>375 FINLEY AVE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              | Unit no.<br>202                                                                                               | Lot/con.<br>N/A               |
| Municipality<br>AJAX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Postal code<br>L1S 2E2       | Province<br>ONTARIO                                                                                           | E-mail<br>info@hvacdesigns.ca |
| Telephone number<br>(905) 619-2300                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Fax number<br>(905) 619-2375 | Cell number<br>( )                                                                                            |                               |
| <b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                                                                               |                               |
| <input type="checkbox"/> House<br><input type="checkbox"/> Small Buildings<br><input type="checkbox"/> Large Buildings<br><input type="checkbox"/> Complex Buildings <input checked="" type="checkbox"/> HVAC – House<br><input type="checkbox"/> Building Services<br><input type="checkbox"/> Detection, Lighting and Power<br><input type="checkbox"/> Fire Protection <input type="checkbox"/> Building Structural<br><input type="checkbox"/> Plumbing – House<br><input type="checkbox"/> Plumbing – All Buildings<br><input type="checkbox"/> On-site Sewage Systems |                              |                                                                                                               |                               |
| Description of designer's work<br>HEAT LOSS / GAIN CALCULATIONS<br>DUCT SIZING<br>RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY<br>RESIDENTIAL SYSTEM DESIGN per CSA-F280-12                                                                                                                                                                                                                                                                                                                                                                                            |                              | Model: 45-05<br><br>OPT 2ND<br><br>Project: VALES OF HUMBER                                                   |                               |
| <b>D. Declaration of Designer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |                                                                                                               |                               |
| I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate):<br>(print name)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                                                                                                               |                               |
| <input type="checkbox"/> I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories.<br><br>Individual BCIN: _____<br>Firm BCIN: _____                                                                                                                                                                                                                                                              |                              |                                                                                                               |                               |
| <input checked="" type="checkbox"/> I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code.<br><br>Individual BCIN: <u>19669</u><br>Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>                                                                                                                                                                                                                     |                              |                                                                                                               |                               |
| <input type="checkbox"/> The design work is exempt from the registration and qualification requirements of the Building Code.<br>Basis for exemption from registration and qualification: _____                                                                                                                                                                                                                                                                                                                                                                             |                              |                                                                                                               |                               |
| I certify that:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                                                                                               |                               |
| 1. The information contained in this schedule is true to the best of my knowledge.<br>2. I have submitted this application with the knowledge and consent of the firm.                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                                                                                               |                               |
| March 22, 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              | <br>Signature of Designer |                               |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                                                                                                               |                               |

**NOTE:**

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

**Application for a Permit Construct or Demolish – Effective January 1, 2015**

| SITE NAME: VALES OF HUMBER     |  |           |       |           |      |           |      |           |      | OPT 2ND     |      |           |      | DATE: Mar-22 |      |           |      | WINTER NATURAL AIR CHANGE RATE 0.227 |      |           |      |                                      |      | HEAT LOSS ΔT °F. 74 |      |      |      | CSA-F280-12         |      |      |      |                   |      |  |  |
|--------------------------------|--|-----------|-------|-----------|------|-----------|------|-----------|------|-------------|------|-----------|------|--------------|------|-----------|------|--------------------------------------|------|-----------|------|--------------------------------------|------|---------------------|------|------|------|---------------------|------|------|------|-------------------|------|--|--|
| BUILDER: ROYAL PINE HOMES      |  |           |       |           |      |           |      |           |      | TYPE: 45-05 |      |           |      | GFA: 3854    |      |           |      | LO# 93104                            |      |           |      | SUMMER NATURAL AIR CHANGE RATE 0.074 |      |                     |      |      |      | HEAT GAIN ΔT °F. 11 |      |      |      | SB-12 PERFORMANCE |      |  |  |
| ROOM USE                       |  |           |       | MBR       |      |           |      | ENS       |      |             |      | BED-2     |      | BED-3        |      | BED-4     |      | ENS-2                                |      | ENS-3     |      | BED-5                                |      | S-BATH              |      |      |      |                     |      |      |      |                   |      |  |  |
| EXP. WALL                      |  |           |       | 50        |      |           |      | 28        |      |             |      | 29        |      | 42           |      | 13        |      | 9                                    |      | 7         |      | 15                                   |      | 7                   |      |      |      |                     |      |      |      |                   |      |  |  |
| CLG. HT.                       |  |           |       | 9         |      |           |      | 9         |      |             |      | 9         |      | 9            |      | 9         |      | 9                                    |      | 9         |      | 9                                    |      | 9                   |      |      |      |                     |      |      |      |                   |      |  |  |
| FACTORS                        |  |           |       |           |      |           |      |           |      |             |      |           |      |              |      |           |      |                                      |      |           |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| GRS.WALL AREA                  |  | LOSS GAIN |       | 450       |      |           |      | 252       |      |             |      | 261       |      | 378          |      | 117       |      | 81                                   |      | 63        |      | 135                                  |      | 63                  |      |      |      |                     |      |      |      |                   |      |  |  |
| GLAZING                        |  |           |       | LOSS GAIN |      | LOSS GAIN |      | LOSS GAIN |      | LOSS GAIN   |      | LOSS GAIN |      | LOSS GAIN    |      | LOSS GAIN |      | LOSS GAIN                            |      | LOSS GAIN |      | LOSS GAIN                            |      | LOSS GAIN           |      |      |      |                     |      |      |      |                   |      |  |  |
| NORTH                          |  | 20.8      | 15.5  | 0         | 0    | 0         | 0    | 0         | 0    | 0           | 0    | 0         | 0    | 0            | 0    | 0         | 0    | 9                                    | 187  | 139       | 0    | 0                                    | 0    | 0                   | 0    | 0    | 0    | 0                   | 0    | 0    | 0    |                   |      |  |  |
| EAST                           |  | 20.8      | 41.0  | 0         | 0    | 0         | 0    | 0         | 0    | 0           | 0    | 53        | 1101 | 2176         | 79   | 1641      | 3243 | 0                                    | 0    | 0         | 20   | 416                                  | 821  | 0                   | 0    | 0    | 0    | 0                   | 0    | 0    | 0    |                   |      |  |  |
| SOUTH                          |  | 20.8      | 24.4  | 0         | 0    | 0         | 0    | 0         | 0    | 0           | 0    | 0         | 0    | 0            | 0    | 0         | 18   | 374                                  | 439  | 0         | 0    | 0                                    | 18   | 374                 | 439  | 8    | 166  | 195                 |      |      |      |                   |      |  |  |
| WEST                           |  | 20.8      | 41.0  | 28        | 582  | 1149      | 19   | 395       | 780  |             |      | 0         | 0    | 0            | 0    | 0         | 0    | 0                                    | 0    | 0         | 0    | 0                                    | 0    | 0                   | 0    | 0    | 0    | 0                   | 0    | 0    | 0    |                   |      |  |  |
| SKYLT.                         |  | 34.1      | 100.3 | 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    | 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    |                   |      |  |  |
| NET EXPOSED WALL               |  | 3.5       | 0.5   | 422       | 1463 | 217       | 233  | 808       | 120  |             |      | 208       | 721  | 107          | 299  | 1037      | 154  | 99                                   | 343  | 51        | 72   | 250                                  | 37   | 43                  | 149  | 22   | 117  | 406                 | 60   | 55   | 191  | 28                |      |  |  |
| 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                 |      |  |  |
| EXPOSED CLG                    |  | 1.3       | 0.6   | 576       | 722  | 321       | 171  | 214       | 95   |             |      | 190       | 238  | 106          | 308  | 386       | 172  | 241                                  | 302  | 134       | 87   | 109                                  | 48   | 60                  | 75   | 33   | 210  | 263                 | 117  | 111  | 139  | 62                |      |  |  |
| NO ATTIC EXPOSED CLG           |  | 2.7       | 1.2   | 0         | 0    | 0         | 0    | 0         | 0    |             |      | 21        | 56   | 25           | 36   | 97        | 43   | 0                                    | 0    | 0         | 0    | 0                                    | 0    | 7                   | 19   | 8    | 0    | 0                   | 0    | 0    | 0    | 0                 |      |  |  |
| EXPOSED FLOOR                  |  | 2.5       | 0.4   | 0         | 0    | 0         | 0    | 0         | 0    |             |      | 211       | 525  | 78           | 0    | 0         | 0    | 0                                    | 0    | 0         | 56   | 139                                  | 21   | 67                  | 167  | 25   | 0    | 0                   | 0    | 0    | 0    | 0                 |      |  |  |
| BASEMENT/CRAWL HEAT LOSS       |  |           |       | 0         |      | 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                                    |      | 0         |      | 0                                    |      | 0                   |      | 0    |      | 0                   |      | 0    |      | 0                 |      |  |  |
| SUBTOTAL HT LOSS               |  |           |       | 2767      |      | 1417      |      | 2642      |      | 3161        |      | 1019      |      | 685          |      | 825       |      | 1043                                 |      | 496       |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| SUB TOTAL HT GAIN              |  |           |       | 1687      |      | 995       |      | 2491      |      | 3611        |      | 624       |      | 245          |      | 910       |      | 616                                  |      | 285       |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| LEVEL FACTOR / MULTIPLIER      |  | 0.20      | 0.22  |           |      | 0.20      | 0.22 | 0.20      | 0.22 | 0.20        | 0.22 | 0.20      | 0.22 | 0.20         | 0.22 | 0.20      | 0.22 | 0.20                                 | 0.22 | 0.20      | 0.22 | 0.20                                 | 0.22 | 0.20                | 0.22 | 0.20 | 0.22 | 0.20                | 0.22 | 0.20 | 0.22 | 0.20              | 0.22 |  |  |
| AIR CHANGE HEAT LOSS           |  |           |       | 620       |      | 318       |      | 592       |      | 708         |      | 228       |      | 154          |      | 185       |      | 234                                  |      | 111       |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| AIR CHANGE HEAT GAIN           |  |           |       | 77        |      | 45        |      | 114       |      | 165         |      | 28        |      | 11           |      | 41        |      | 28                                   |      | 13        |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| DUCT LOSS                      |  |           |       | 0         |      | 0         |      | 323       |      | 0           |      | 0         |      | 84           |      | 101       |      | 0                                    |      | 0         |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| DUCT GAIN                      |  |           |       | 0         |      | 0         |      | 373       |      | 0           |      | 0         |      | 26           |      | 95        |      | 0                                    |      | 0         |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| HEAT GAIN PEOPLE               |  | 240       | 2     | 480       |      | 0         |      | 1         |      | 240         |      | 1         |      | 240          |      | 1         |      | 240                                  |      | 0         |      | 1                                    |      | 240                 |      | 0    |      | 0                   |      | 0    |      | 0                 |      |  |  |
| HEAT GAIN APPLIANCES/LIGHTS    |  |           |       | 887       |      | 0         |      | 887       |      | 887         |      | 887       |      | 0            |      | 0         |      | 887                                  |      | 0         |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| TOTAL HT LOSS BTU/H            |  |           |       | 3387      |      | 1734      |      | 3558      |      | 3869        |      | 1248      |      | 922          |      | 1111      |      | 1276                                 |      | 607       |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |
| TOTAL HT GAIN x 1.3 BTU/H      |  |           |       | 4071      |      | 1352      |      | 5337      |      | 6374        |      | 2314      |      | 367          |      | 1360      |      | 2303                                 |      | 388       |      |                                      |      |                     |      |      |      |                     |      |      |      |                   |      |  |  |

| ROOM USE                       |      |       | GRT  |      |      | DIN  |      |     | KT/BF |      |      | DEN  |      |     | LND  |     |      | PWD |      |     | FOY  |     |      | MUD  |      |     |      |     |      |       |      |     |      |     |      | BAS  |   |  |
|--------------------------------|------|-------|------|------|------|------|------|-----|-------|------|------|------|------|-----|------|-----|------|-----|------|-----|------|-----|------|------|------|-----|------|-----|------|-------|------|-----|------|-----|------|------|---|--|
| EXP. WALL                      |      |       | 37   |      |      | 30   |      |     | 41    |      |      | 28   |      |     | 0    |     |      | 7   |      |     | 24   |     |      | 34   |      |     |      |     |      |       |      |     |      |     |      | 198  |   |  |
| CLG. HT.                       |      |       | 10   |      |      | 10   |      |     | 10    |      |      | 10   |      |     | 9    |     |      | 10  |      |     | 11   |     |      | 11   |      |     |      |     |      |       |      |     |      |     |      | 10   |   |  |
| FACTORS                        |      | LOSS  |      | GAIN |      |      |      |     |       |      |      |      |      |     |      |     |      |     |      |     |      |     |      |      |      |     |      |     |      |       |      |     |      |     |      |      |   |  |
| GRS.WALL AREA                  |      |       | 370  |      |      |      | 300  |     |       |      | 410  |      |      |     | 280  |     |      |     | 0    |     |      |     | 70   |      |      |     | 264  |     |      |       | 374  |     |      |     | 1386 |      |   |  |
| GLAZING                        |      |       | LOSS |      | GAIN |      | LOSS |     | GAIN  |      | LOSS |      | GAIN |     | LOSS |     | GAIN |     | LOSS |     | GAIN |     | LOSS |      | GAIN |     | LOSS |     | GAIN |       | LOSS |     | GAIN |     | LOSS |      |   |  |
| NORTH                          | 20.8 | 15.5  | 0    | 0    | 0    | 0    | 0    | 0   | 0     | 0    | 0    | 0    | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0    | 13   | 270 | 201  |     |      |       |      |     |      | 3   | 62   | 46   |   |  |
| EAST                           | 20.8 | 41.0  | 0    | 0    | 0    | 0    | 0    | 0   | 0     | 0    | 0    | 0    | 0    | 0   | 36   | 748 | 1478 | 0   | 0    | 0   | 0    | 0   | 0    | 0    | 14   | 291 | 575  | 0   | 0    | 0     | 0    | 0   | 0    | 0   | 0    | 0    | 0 |  |
| SOUTH                          | 20.8 | 24.4  | 0    | 0    | 0    | 0    | 46   | 956 | 1122  | 14   | 291  | 342  | 0    | 0   | 0    | 0   | 0    | 0   | 8    | 166 | 195  | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0    | 0     | 0    | 0   | 0    | 6   | 125  | 146  |   |  |
| WEST                           | 20.8 | 41.0  | 48   | 997  | 1970 | 0    | 0    | 0   | 0     | 96   | 1994 | 3941 | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0    | 0     | 0    | 0   | 6    | 125 | 246  |      |   |  |
| SKYLT.                         | 34.1 | 100.3 | 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    | 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   | 20   | 493  | 73   | 40  | 986  | 146 |      |       |      |     |      | 20  | 493  | 73   |   |  |
| NET EXPOSED WALL               | 3.5  | 0.5   | 322  | 1116 | 166  | 254  | 881  | 131 | 300   | 1040 | 154  | 244  | 846  | 125 | 0    | 0   | 0    | 62  | 215  | 32  | 230  | 797 | 118  | 321  | 1113 | 165 |      |     |      |       |      |     |      | 0   | 0    | 0    |   |  |
| 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    | 594 | 2087 | 309 |      |      |   |  |
| EXPOSED CLG                    | 1.3  | 0.6   | 0    | 0    | 0    | 0    | 0    | 0   | 0     | 0    | 0    | 0    | 0    | 0   | 112  | 140 | 62   | 0   | 0    | 0   | 0    | 0   | 0    | 0    | 0    | 0   | 0    | 0   | 0    | 0     | 0    | 0   | 0    | 0   | 0    |      |   |  |
| 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   | 0    | 0   | 0    |      |   |  |
| EXPOSED FLOOR                  | 2.5  | 0.4   | 0    | 0    | 0    | 0    | 0    | 0   | 0     | 0    | 0    | 0    | 0    | 0   | 103  | 256 | 38   | 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     |      |     | 0    |     |      | 7066 |   |  |
| SLAB ON GRADE HEAT LOSS        |      |       | 0    |      |      | 0    |      |     | 0     |      |      | 0    |      |     | 0    |     |      | 0   |      |     | 0    |     |      | 0    |      |     | 0    |     |      | 0     |      |     | 0    |     |      | 0    |   |  |
| SUBTOTAL HT LOSS               |      |       | 2114 |      |      | 1836 |      |     | 3326  |      |      | 1594 |      |     | 397  |     |      | 381 |      |     | 1581 |     |      | 2369 |      |     |      |     |      |       |      |     | 9957 |     |      |      |   |  |
| SUB TOTAL HT GAIN              |      |       | 2136 |      |      | 1253 |      |     | 4436  |      |      | 1603 |      |     | 100  |     |      | 227 |      |     | 766  |     |      | 512  |      |     |      |     |      |       |      |     | 822  |     |      |      |   |  |
| LEVEL FACTOR / MULTIPLIER      | 0.30 |       | 0.37 |      | 0.30 |      | 0.37 |     | 0.30  |      | 0.37 |      | 0.30 |     | 0.22 |     | 0.30 |     | 0.37 |     | 0.30 |     | 0.37 |      | 0.30 |     | 0.37 |     | 0.50 |       | 0.81 |     |      |     |      |      |   |  |
| AIR CHANGE HEAT LOSS           |      |       | 778  |      |      | 676  |      |     | 1224  |      |      | 587  |      |     | 89   |     |      | 140 |      |     | 582  |     |      | 872  |      |     |      |     |      | 8097  |      |     |      |     |      |      |   |  |
| AIR CHANGE HEAT GAIN           |      |       | 97   |      |      | 57   |      |     | 202   |      |      | 73   |      |     | 5    |     |      | 10  |      |     | 35   |     |      | 23   |      |     |      |     |      | 37    |      |     |      |     |      |      |   |  |
| DUCT LOSS                      |      |       | 0    |      |      | 0    |      |     | 0     |      |      | 0    |      |     | 49   |     |      | 0   |      |     | 0    |     |      | 0    |      |     |      |     |      | 0     |      |     |      |     |      |      |   |  |
| DUCT GAIN                      |      |       | 0    |      |      | 0    |      |     | 0     |      |      | 0    |      |     | 99   |     |      | 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    |     |      |      |   |  |
| HEAT GAIN APPLIANCES/LIGHTS    |      |       | 887  |      |      | 887  |      |     | 887   |      |      | 887  |      |     | 887  |     |      | 887 |      |     | 0    |     |      | 0    |      |     |      |     |      | 887   |      |     |      |     |      |      |   |  |
| TOTAL HT LOSS BTU/H            |      |       | 2892 |      |      | 2512 |      |     | 4549  |      |      | 2181 |      |     | 534  |     |      | 521 |      |     | 2163 |     |      | 3241 |      |     |      |     |      | 18054 |      |     |      |     |      |      |   |  |
| TOTAL HT GAIN x 1.3 BTU/H      |      |       | 4057 |      |      | 2856 |      |     | 7184  |      |      | 3333 |      |     | 1419 |     |      | 309 |      |     | 1041 |     |      | 696  |      |     |      |     |      | 227   |      |     |      |     |      |      |   |  |

SITE NAME: VALES OF HUMBER  
BUILDER: ROYAL PINE HOMES

OPT 2ND  
TYPE: 45-05

DATE: Mar-22

GFA: 3854 LO# 93104

HEATING CFM 1540 COOLING CFM 1540  
TOTAL HEAT LOSS 54,360 TOTAL HEAT GAIN 47,033  
AIR FLOW RATE CFM 28.33 AIR FLOW RATE CFM 32.74

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

#CARRIER

AFUE = 97 %

59SP5A-80-16

80

INPUT (BTU/H) = 80,000

OUTPUT (BTU/H) = 78,000

FAN SPEED

LOW 0

MEDLOW 975

MEDIUM 1200

MEDIUM HIGH 1370

HIGH 1540

DESIGN CFM = 1540  
CFM @ .6" E.S.P.

TEMPERATURE RISE 47 °F

| RUN COUNT | 4th | 3rd | 2nd | 1st | Bas |
|-----------|-----|-----|-----|-----|-----|
| S/A       | 0   | 0   | 14  | 11  | 5   |
| R/A       | 0   | 0   | 5   | 2   | 1   |

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

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

| RUN #                     | 1    | 2    | 3      | 4     | 5     | 6     | 7    | 8     | 9     | 10   | 11    | 12   | 13   | 14    | 15    | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23   | 24   |
|---------------------------|------|------|--------|-------|-------|-------|------|-------|-------|------|-------|------|------|-------|-------|------|------|------|------|------|------|------|------|------|
| ROOM NAME                 | ENS  | MBR  | S-BATH | BED-2 | BED-3 | BED-5 | ENS  | ENS-3 | ENS-2 | MBR  | BED-4 | GRT  | DIN  | KT/BF | KT/BF | DEN  | LND  | PWD  | FOY  | MUD  | BAS  | BAS  | BAS  | BAS  |
| RM LOSS MBH.              | 0.87 | 1.69 | 0.61   | 1.78  | 1.93  | 1.28  | 0.87 | 1.11  | 0.92  | 1.69 | 1.25  | 1.45 | 2.51 | 1.52  | 1.52  | 1.09 | 0.53 | 0.52 | 2.16 | 3.24 | 3.61 | 3.61 | 3.61 | 3.61 |
| CFM PER RUN HEAT          | 25   | 48   | 17     | 50    | 55    | 36    | 25   | 31    | 26    | 48   | 35    | 41   | 71   | 43    | 43    | 31   | 15   | 15   | 61   | 92   | 102  | 102  | 102  | 102  |
| RM GAIN MBH.              | 0.68 | 2.04 | 0.39   | 2.67  | 3.19  | 2.30  | 0.68 | 1.36  | 0.37  | 2.04 | 2.31  | 2.03 | 2.86 | 2.39  | 2.39  | 1.67 | 1.42 | 0.31 | 1.04 | 0.70 | 0.45 | 0.45 | 0.45 | 0.45 |
| CFM PER RUN COOLING       | 22   | 67   | 13     | 87    | 104   | 75    | 22   | 45    | 12    | 67   | 76    | 66   | 94   | 78    | 78    | 55   | 46   | 10   | 34   | 23   | 15   | 15   | 15   | 15   |
| ADJUSTED PRESSURE         | 0.17 | 0.17 | 0.17   | 0.16  | 0.16  | 0.17  | 0.17 | 0.17  | 0.17  | 0.17 | 0.17  | 0.17 | 0.16 | 0.17  | 0.17  | 0.17 | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| ACTUAL DUCT LGH.          | 47   | 71   | 42     | 57    | 41    | 33    | 42   | 44    | 36    | 62   | 15    | 56   | 10   | 39    | 46    | 27   | 15   | 14   | 30   | 38   | 55   | 37   | 22   | 11   |
| EQUIVALENT LENGTH         | 160  | 220  | 220    | 150   | 170   | 190   | 150  | 160   | 180   | 210  | 110   | 130  | 110  | 160   | 120   | 110  | 150  | 110  | 110  | 120  | 120  | 130  | 90   | 130  |
| TOTAL EFFECTIVE LENGTH    | 207  | 291  | 262    | 207   | 211   | 223   | 192  | 204   | 216   | 272  | 125   | 186  | 120  | 199   | 166   | 137  | 165  | 124  | 140  | 158  | 175  | 167  | 112  | 141  |
| ADJUSTED PRESSURE         | 0.08 | 0.06 | 0.07   | 0.08  | 0.08  | 0.08  | 0.09 | 0.08  | 0.08  | 0.06 | 0.14  | 0.09 | 0.14 | 0.09  | 0.1   | 0.13 | 0.1  | 0.14 | 0.12 | 0.1  | 0.09 | 0.1  | 0.14 | 0.11 |
| ROUND DUCT SIZE           | 4    | 6    | 4      | 6     | 6     | 6     | 4    | 5     | 4     | 6    | 6     | 5    | 6    | 6     | 6     | 5    | 4    | 4    | 5    | 6    | 6    | 6    | 6    | 6    |
| HEATING VELOCITY (ft/min) | 287  | 245  | 195    | 255   | 280   | 184   | 287  | 228   | 298   | 245  | 178   | 301  | 362  | 219   | 219   | 228  | 172  | 172  | 448  | 469  | 520  | 520  | 520  | 520  |
| COOLING VELOCITY (ft/min) | 252  | 342  | 149    | 444   | 530   | 382   | 252  | 330   | 138   | 342  | 388   | 485  | 479  | 398   | 398   | 404  | 528  | 115  | 250  | 117  | 76   | 76   | 76   | 76   |
| OUTLET GRILL SIZE         | 3X10 | 4X10 | 3X10   | 4X10  | 4X10  | 4X10  | 3X10 | 3X10  | 3X10  | 4X10 | 4X10  | 3X10 | 4X10 | 4X10  | 4X10  | 3X10 | 3X10 | 3X10 | 3X10 | 4X10 | 4X10 | 4X10 | 4X10 | 4X10 |
| TRUNK                     | B    | A    | B      | C     | E     | B     | B    | E     | C     | A    | E     | A    | C    | B     | B     | D    | E    | E    | D    | C    | A    | B    | C    | E    |

| RUN #                     | 25   | 26    | 27    | 28   | 29    | 30   |
|---------------------------|------|-------|-------|------|-------|------|
| ROOM NAME                 | BAS  | BED-2 | BED-3 | GRT  | KT/BF | DEN  |
| RM LOSS MBH.              | 3.61 | 1.78  | 1.93  | 1.45 | 1.52  | 1.09 |
| CFM PER RUN HEAT          | 102  | 50    | 55    | 41   | 43    | 31   |
| RM GAIN MBH.              | 0.45 | 2.67  | 3.19  | 2.03 | 2.39  | 1.67 |
| CFM PER RUN COOLING       | 15   | 87    | 104   | 66   | 78    | 55   |
| ADJUSTED PRESSURE         | 0.16 | 0.16  | 0.16  | 0.17 | 0.17  | 0.17 |
| ACTUAL DUCT LGH.          | 21   | 49    | 47    | 62   | 50    | 26   |
| EQUIVALENT LENGTH         | 120  | 170   | 160   | 110  | 140   | 110  |
| TOTAL EFFECTIVE LENGTH    | 141  | 219   | 207   | 172  | 190   | 136  |
| ADJUSTED PRESSURE         | 0.11 | 0.07  | 0.08  | 0.1  | 0.09  | 0.13 |
| ROUND DUCT SIZE           | 6    | 6     | 6     | 5    | 6     | 5    |
| HEATING VELOCITY (ft/min) | 520  | 255   | 280   | 301  | 219   | 228  |
| COOLING VELOCITY (ft/min) | 76   | 444   | 530   | 485  | 398   | 404  |
| OUTLET GRILL SIZE         | 4X10 | 4X10  | 4X10  | 3X10 | 4X10  | 3X10 |
| TRUNK                     | D    | C     | E     | A    | B     | D    |

## SUPPLY AIR TRUNK SIZE

|         | TRUNK | STATIC | ROUND | RECT |   |   | VELOCITY |         | TRUNK | STATIC | ROUND | RECT |   |   | VELOCITY |
|---------|-------|--------|-------|------|---|---|----------|---------|-------|--------|-------|------|---|---|----------|
|         | CFM   | PRESS. | DUCT  | DUCT |   |   | (ft/min) |         | CFM   | PRESS. | DUCT  | DUCT |   |   | (ft/min) |
| TRUNK A | 280   | 0.06   | 9.4   | 10   | x | 8 | 504      | TRUNK G | 0     | 0.00   | 0     | 0    | x | 8 | 0        |
| TRUNK B | 614   | 0.06   | 12.6  | 20   | x | 8 | 553      | TRUNK H | 0     | 0.00   | 0     | 0    | x | 8 | 0        |
| TRUNK C | 1005  | 0.06   | 15.1  | 26   | x | 8 | 696      | TRUNK I | 0     | 0.00   | 0     | 0    | x | 8 | 0        |
| TRUNK D | 225   | 0.11   | 7.4   | 8    | x | 8 | 506      | TRUNK J | 0     | 0.00   | 0     | 0    | x | 8 | 0        |
| TRUNK E | 533   | 0.08   | 11.1  | 14   | x | 8 | 685      | TRUNK K | 0     | 0.00   | 0     | 0    | x | 8 | 0        |
| TRUNK F | 0     | 0.00   | 0     | 0    | x | 8 | 0        | TRUNK L | 0     | 0.00   | 0     | 0    | x | 8 | 0        |

## RETURN AIR TRUNK SIZE

| TYPE    | 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 | 1255         | 0.05             | 17.2          | 28           | x | 10 | 645                  |
| TRUNK Y | 285          | 0.05             | 9.9           | 12           | x | 8  | 428                  |
| TRUNK Z | 630          | 0.05             | 13.3          | 20           | x | 8  | 567                  |
| DROP    | 1540         | 0.05             | 18.5          | 24           | x | 14 | 660                  |

| RETURN AIR #       | 1    | 2    | 3    | 4    | 5     | 6    | 7    | 8    | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19    | 20    | 21    | 22    | 23    | 24    |
|--------------------|------|------|------|------|-------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| AIR VOLUME         | 130  | 115  | 230  | 145  | 0     | 130  | 400  | 155  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| PLENUM PRESSURE    | 0.15 | 0.15 | 0.15 | 0.15 | 0.15  | 0.15 | 0.15 | 0.15 | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  |
| ACTUAL DUCT LGH.   | 61   | 62   | 37   | 45   | 1     | 49   | 17   | 38   | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     |
| EQUIVALENT LENGTH  | 205  | 245  | 175  | 165  | 0     | 205  | 160  | 200  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| TOTAL EFFECTIVE LH | 266  | 307  | 212  | 210  | 1     | 254  | 177  | 238  | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     |
| ADJUSTED PRESSURE  | 0.06 | 0.05 | 0.07 | 0.07 | 14.80 | 0.06 | 0.08 | 0.06 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 | 14.80 |
| ROUND DUCT SIZE    | 7    | 7    | 8.4  | 7    | 0     | 7    | 9.9  | 7.5  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| INLET GRILL SIZE   | 8    | 8    | 8    | 8    | 0     | 8    | 8    | 8    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| INLET GRILL SIZE   | 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   | 24   | 14   | 0     | 14   | 30   | 14   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |

TYPE: 45-05  
SITE NAME: VALES OF HUMBER

LO # 93104  
OPT 2ND

**RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY**

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

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

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

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

|                                   |                       |
|-----------------------------------|-----------------------|
| <b>TOTAL VENTILATION CAPACITY</b> | <b>9.32.3.3(1)</b>    |
| Basement + Master Bedroom         | 2 @ 21.2 cfm 42.4 cfm |
| Other Bedrooms                    | 4 @ 10.6 cfm 42.4 cfm |
| Kitchen & Bathrooms               | 6 @ 10.6 cfm 63.6 cfm |
| Other Rooms                       | 5 @ 10.6 cfm 53.0 cfm |
| Table 9.32.3.A.                   | TOTAL 201.4 cfm       |

|                                                |                     |
|------------------------------------------------|---------------------|
| <b>PRINCIPAL VENTILATION CAPACITY REQUIRED</b> | <b>9.32.3.4.(1)</b> |
| 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            |
| <b>TOTAL</b>                                   | <b>95.4 cfm</b>     |

|                                          |                  |
|------------------------------------------|------------------|
| <b>SUPPLEMENTAL VENTILATION CAPACITY</b> | <b>9.32.3.5.</b> |
| Total Ventilation Capacity               | 201.4 cfm        |
| Less Principal Ventil. Capacity          | 95.4 cfm         |
| Required Supplemental Capacity           | 106.0 cfm        |

|                                       |                                                  |
|---------------------------------------|--------------------------------------------------|
| <b>PRINCIPAL EXHAUST FAN CAPACITY</b> |                                                  |
| Model: VANEE V150H                    | Location: BSMT                                   |
| 95.4 cfm                              | <input checked="" type="checkbox"/> HVI Approved |

|                                                |               |        |        |      |
|------------------------------------------------|---------------|--------|--------|------|
| <b>PRINCIPAL EXHAUST HEAT LOSS CALCULATION</b> |               |        |        |      |
| CFM                                            | $\Delta T$ °F | FACTOR | % LOSS |      |
| 95.4 CFM                                       | X 74 F        | X 1.08 | X      | 0.25 |

|                          |                          |                                 |                                     |       |
|--------------------------|--------------------------|---------------------------------|-------------------------------------|-------|
| <b>SUPPLEMENTAL FANS</b> |                          | <b>BY INSTALLING CONTRACTOR</b> |                                     |       |
| Location                 | Model                    | cfm                             | HVI                                 | Sones |
| ENS                      | BY INSTALLING CONTRACTOR | 50                              | <input checked="" type="checkbox"/> | 3.5   |
| ENS-2                    | BY INSTALLING CONTRACTOR | 50                              | <input checked="" type="checkbox"/> | 3.5   |
| S-BATH                   | BY INSTALLING CONTRACTOR | 50                              | <input checked="" type="checkbox"/> | 3.5   |
| PWD                      | BY INSTALLING CONTRACTOR | 50                              | <input checked="" type="checkbox"/> | 3.5   |

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

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

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

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

|                                                                                                               |                                                                                       |
|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>DESIGNER CERTIFICATION</b>                                                                                 |                                                                                       |
| I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code. |                                                                                       |
| Name:                                                                                                         | HVAC Designs Ltd.                                                                     |
| Signature:                                                                                                    |  |
| HRAI #                                                                                                        | 001820                                                                                |
| Date:                                                                                                         | March-22                                                                              |

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

| CSA F280-12 Residential Heat Loss and Heat Gain Calculations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------|-------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|-------|-------|--------|-------|-------|--------|------|--------|-------|-------|-----|--------|-------|--------|---|---|-------|--------|---|---|--------------|--------|--|--|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------|-------|--------------------------------|-------|-------------------------------|--|--|--|--|--|--------|---------|-------|-------|-------------|----|-----|----|----|-------------|----|----|---|----|
| Formula Sheet (For Air Leakage / Ventilation Calculation)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| LO#: 93104                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Model: 45-05      | Builder: ROYAL PINE HOMES                           | Date: 2022-03-22                                                                                                                       |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <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>1724</td> <td>10</td> <td>17240</td> </tr> <tr> <td>First</td> <td>1724</td> <td>10</td> <td>17240</td> </tr> <tr> <td>Second</td> <td>2130</td> <td>9</td> <td>19170</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>53,650.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1519.2 m³</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                |                   |                                                     | Level                                                                                                                                  | Floor Area (ft²)                                          | Floor Height (ft) | Volume (ft³)      | Bsmt                                                | 1724                                                | 10                                                        | 17240 | First | 1724   | 10    | 17240 | Second | 2130 | 9      | 19170 | Third | 0   | 9      | 0     | Fourth | 0 | 9 | 0     | Total: |   |   | 53,650.0 ft³ | Total: |  |  | 1519.2 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%;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.074</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>-19</td> <td>41</td> <td>74</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>30</td> <td>6</td> <td>11</td> </tr> </table> |  | WINTER NATURAL AIR CHANGE RATE | 0.227 | SUMMER NATURAL AIR CHANGE RATE | 0.074 | Design Temperature Difference |  |  |  |  |  | Tin °C | Tout °C | ΔT °C | ΔT °F | Winter DTDh | 22 | -19 | 41 | 74 | Summer DTDc | 24 | 30 | 6 | 11 |
| Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Floor Area (ft²)  | Floor Height (ft)                                   | Volume (ft³)                                                                                                                           |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Bsmt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1724              | 10                                                  | 17240                                                                                                                                  |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| First                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1724              | 10                                                  | 17240                                                                                                                                  |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Second                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2130              | 9                                                   | 19170                                                                                                                                  |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Third                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                 | 9                                                   | 0                                                                                                                                      |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Fourth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                 | 9                                                   | 0                                                                                                                                      |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Total:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                                     | 53,650.0 ft³                                                                                                                           |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Total:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                                     | 1519.2 m³                                                                                                                              |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| WINTER NATURAL AIR CHANGE RATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.227             |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| SUMMER NATURAL AIR CHANGE RATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.074             |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Design Temperature Difference                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                                                     |                                                                                                                                        |                                                           |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Tin °C            | Tout °C                                             | ΔT °C                                                                                                                                  | ΔT °F                                                     |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Winter DTDh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 22                | -19                                                 | 41                                                                                                                                     | 74                                                        |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| Summer DTDc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 24                | 30                                                  | 6                                                                                                                                      | 11                                                        |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| <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>0.227 x 422.00 x 41 °C x 1.2 = 4746 W</p> <p>= 16194 Btu/h</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |                                                     | $HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p>= 0.074 x 422.00 x 6 °C x 1.2 = 229 W</p> <p>= 780 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>95 CFM x 74 °F x 1.08 x 0.25 = 1911 Btu/h</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                                                     | $HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>95 CFM x 11 °F x 1.08 x 0.25 = 283 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; vertical-align: middle;">16,194</td> <td>9,957</td> <td>0.813</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>13,201</td> <td>0.368</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>14,451</td> <td>0.224</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   | 16,194 | 9,957 | 0.813 | 2      | 0.3  | 13,201 | 0.368 | 3     | 0.2 | 14,451 | 0.224 | 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               | 16,194                                              | 9,957                                                                                                                                  | 0.813                                                     |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.3               |                                                     | 13,201                                                                                                                                 | 0.368                                                     |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.2               |                                                     | 14,451                                                                                                                                 | 0.224                                                     |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0                 |                                                     | 0                                                                                                                                      | 0.000                                                     |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0                 |                                                     | 0                                                                                                                                      | 0.000                                                     |                   |                   |                                                     |                                                     |                                                           |       |       |        |       |       |        |      |        |       |       |     |        |       |        |   |   |       |        |   |   |              |        |  |  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                |       |                                |       |                               |  |  |  |  |  |        |         |       |       |             |    |     |    |    |             |    |    |   |    |

**HEAT LOSS AND GAIN SUMMARY SHEET**

|                     |                  |                                  |
|---------------------|------------------|----------------------------------|
| <b>MODEL:</b> 45-05 | <b>OPT 2ND</b>   | <b>BUILDER:</b> ROYAL PINE HOMES |
| <b>SFQT:</b> 3854   | <b>LO#</b> 93104 | <b>SITE:</b> VALES OF HUMBER     |

**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 (ft³):                 | 53650.0         | ASSUMED (Y/N):            | Y        |
| INTERNAL SHADING:                   | BLINDS/CURTAINS | ASSUMED OCCUPANTS:        | 6        |
| INTERIOR LIGHTING LOAD (Btu/h/ft²): | 1.75            | DC BRUSHLESS MOTOR (Y/N): | Y        |
| FOUNDATION CONFIGURATION            | BCIN_1          | DEPTH BELOW GRADE:        | 7.0 ft   |
| LENGTH: 61.0 ft                     | WIDTH: 38.0 ft  | EXPOSED PERIMETER:        | 198.0 ft |

**2012 OBC - COMPLIANCE PACKAGE****Component****Compliance Package  
SB-12 PERFORMANCE****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+1.5 | 21.40 |
| 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                            | 1.6    | -     |
| Skylights Maximum U-Value                                                  | 2.6    | -     |
| Space Heating Equipment Minimum AFUE                                       | 96%    | -     |
| HRV Minimum Efficiency                                                     | 75%    | -     |
| Domestic Hot Water Heater Minimum EF                                       | 0.9    | -     |

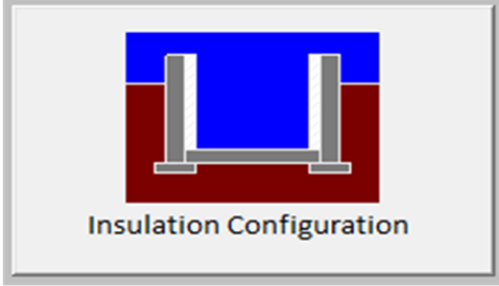
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



# 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):              | 18.6                                      |  |
| Floor Width (m):               | 11.6                                      |                                                                                     |
| Exposed Perimeter (m):         | 0.0                                       |                                                                                     |
| Wall Height (m):               | 3.0                                       |                                                                                     |
| Depth Below Grade (m):         | 2.13                                      |                                                                                     |
| Window Area (m <sup>2</sup> ): | 1.4                                       |                                                                                     |
| Door Area (m <sup>2</sup> ):   | 1.9                                       |                                                                                     |
| Radiant Slab                   |                                           |                                                                                     |
| Heated Fraction of the Slab:   | 0                                         |                                                                                     |
| Fluid Temperature (°C):        | 33                                        |                                                                                     |
| Design Months                  |                                           |                                                                                     |
| Heating Month                  | 1                                         |                                                                                     |
| Foundation Loads               |                                           |                                                                                     |
| Heating Load (Watts):          |                                           | 2070                                                                                |

TYPE: 45-05  
LO# 93104

OPT 2ND

# 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):       | 6.71                           |                        |    |    |
| Building Configuration            |                                |                        |    |    |
| Type:                             | Detached                       |                        |    |    |
| Number of Stories:                | Two                            |                        |    |    |
| Foundation:                       | Full                           |                        |    |    |
| House Volume (m <sup>3</sup> ):   | 1519.2                         |                        |    |    |
| Air Leakage/Ventilation           |                                |                        |    |    |
| Air Tightness Type:               | Energy Star Detached (2.5 ACH) |                        |    |    |
| Custom BDT Data:                  | ELA @ 10 Pa.                   | 1418.2 cm <sup>2</sup> |    |    |
|                                   | 2.50                           | ACH @ 50 Pa            |    |    |
| Mechanical Ventilation (L/s):     | Total Supply                   | Total Exhaust          |    |    |
|                                   | 45.0                           | 45.0                   |    |    |
| Flue Size                         |                                |                        |    |    |
| Flue #:                           | #1                             | #2                     | #3 | #4 |
| Diameter (mm):                    | 0                              | 0                      | 0  | 0  |
| Natural Infiltration Rates        |                                |                        |    |    |
| Heating Air Leakage Rate (ACH/H): | 0.227                          |                        |    |    |
| Cooling Air Leakage Rate (ACH/H): | 0.074                          |                        |    |    |

TYPE: 45-05  
LO# 93104

OPT 2ND

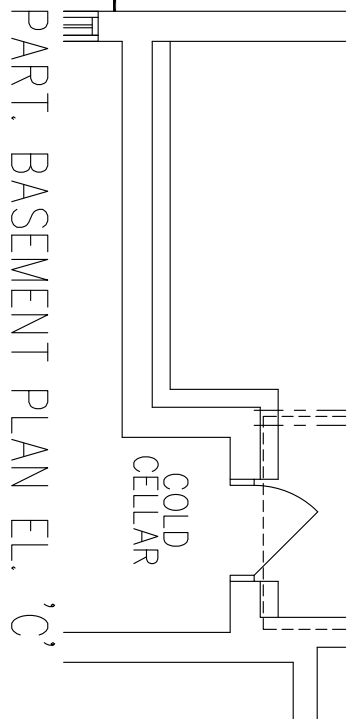
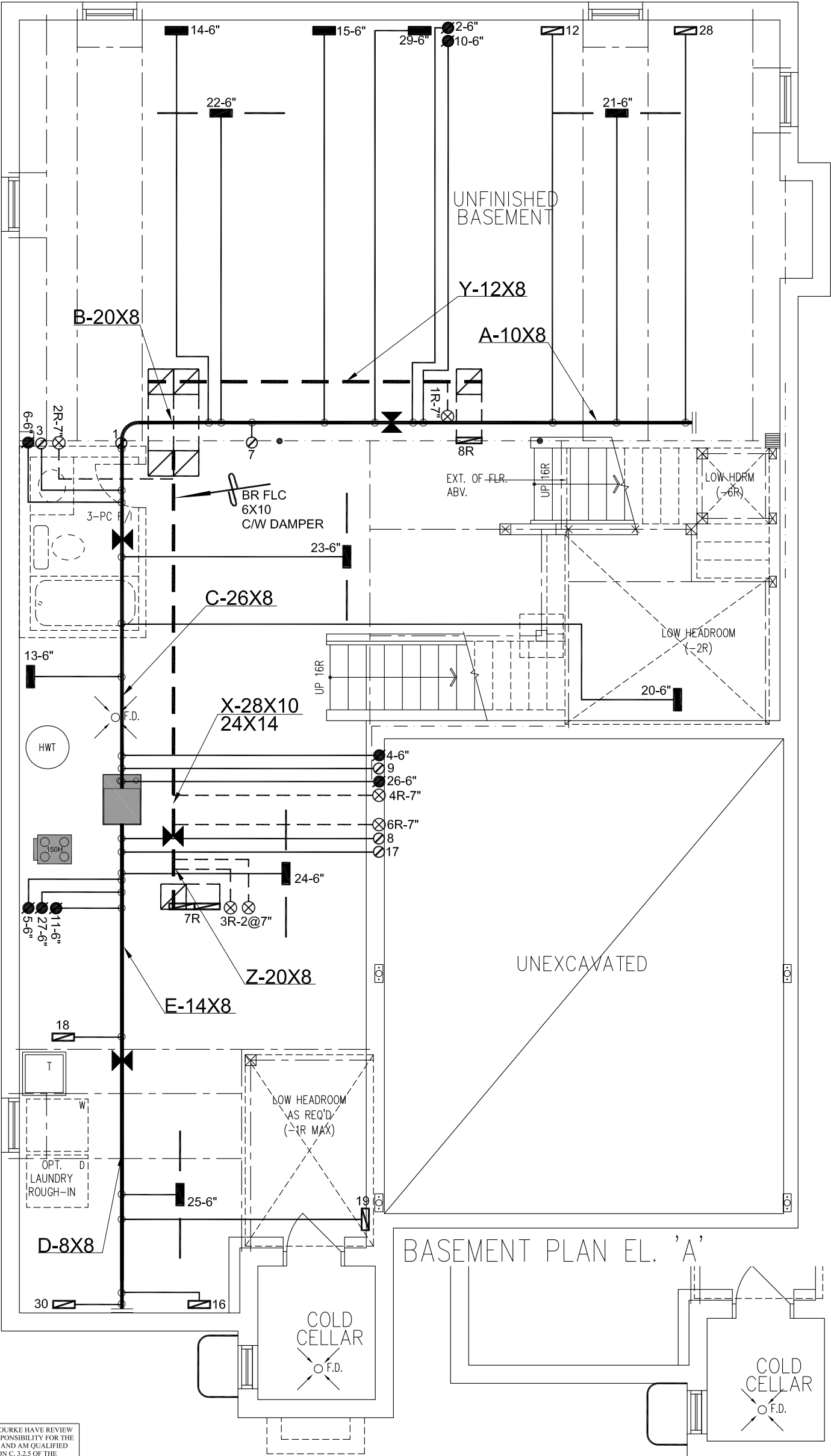
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

| HVAC LEGEND |                           |        |                                 |        |                              |        |                            | 3.        |                             |          |
|-------------|---------------------------|--------|---------------------------------|--------|------------------------------|--------|----------------------------|-----------|-----------------------------|----------|
| SYMBOL      | DESCRIPTION               | SYMBOL | DESCRIPTION                     | SYMBOL | DESCRIPTION                  | SYMBOL | DESCRIPTION                | 2.        |                             |          |
|             | SUPPLY AIR GRILLE         |        | 6" SUPPLY AIR BOOT ABOVE        |        | 14"x8" RETURN AIR GRILLE     |        | RETURN AIR STACK ABOVE     | 1.        | REVISED TO PERFORMANCE PATH | MAR/2022 |
|             | SUPPLY AIR GRILLE 6" BOOT |        | SUPPLY AIR STACK FROM 2nd FLOOR |        | 30"x8" RETURN AIR GRILLE     |        | RETURN AIR STACK 2nd FLOOR | No.       | Description                 | Date     |
|             | SUPPLY AIR BOOT ABOVE     |        | 6" SUPPLY AIR STACK 2nd FLOOR   |        | FRA- FLOOR RETURN AIR GRILLE |        | REDUCER                    | REVISIONS |                             |          |

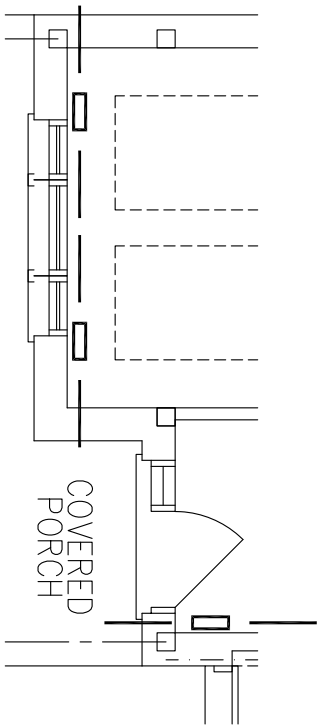
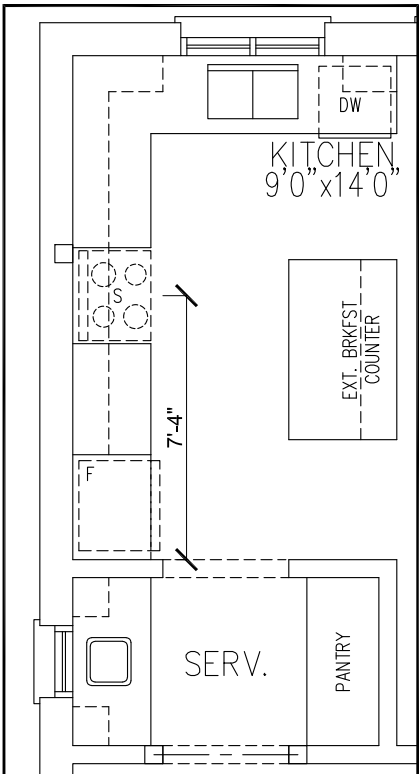
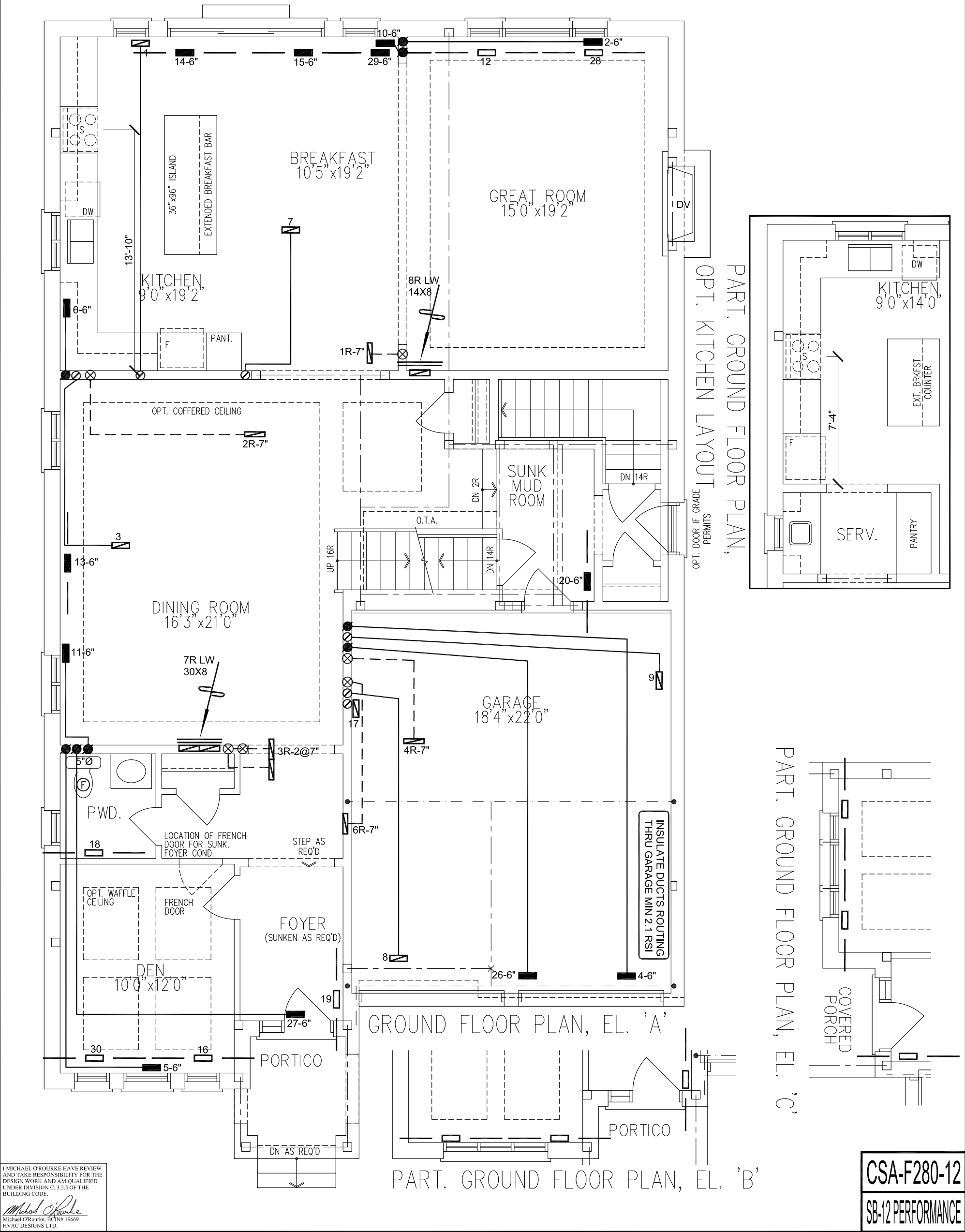
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|                                                      |                                                                                                                                                                                                                                                                                                      |  |                                    |           |                        |                                                                                                                                               |   |   |                               |             |               |       |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------|-----------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---|---|-------------------------------|-------------|---------------|-------|
| Client                                               | <div><div><div>HVAC</div><div>DESIGNS LTD.</div></div><div>375 Finley Ave. Suite 202 - Ajax, Ontario<br/>L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375<br/>Email: info@hvacdesigns.ca<br/>Web: www.hvacdesigns.ca<br/>Specializing in Residential Mechanical Design Services</div></div> |  | HEAT LOSS 56272 BTU/H<br>UNIT DATA |           | # OF RUNS S/A R/A FANS |                                                                                                                                               |   |   | Sheet Title                   |             |               |       |
| ROYAL PINE HOMES                                     | <div>Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.</div>                                   |  | MAKE                               | CARRIER   | 3RD FLOOR              |                                                                                                                                               |   |   | BASEMENT<br>HEATING<br>LAYOUT |             |               |       |
| MODEL                                                |                                                                                                                                                                                                                                                                                                      |  | 59SP5A-80-16                       | 2ND FLOOR | 14                     | 5                                                                                                                                             | 6 |   |                               |             |               |       |
| INPUT                                                |                                                                                                                                                                                                                                                                                                      |  | 80                                 | MBTU/H    | 1ST FLOOR              | 11                                                                                                                                            | 2 | 2 |                               |             |               |       |
| Project Name<br>VALES OF HUMBER<br>BRAMPTON, ONTARIO |                                                                                                                                                                                                                                                                                                      |  | OUTPUT                             | 78        | MBTU/H                 | BASEMENT                                                                                                                                      | 5 | 1 | 0                             | Date        | OCT/2021      |       |
| OPT 2ND<br>45-05                                     |                                                                                                                                                                                                                                                                                                      |  | COOLING                            | 4.0       | TONS                   | 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 |   |   |                               | Scale       | 3/16" = 1'-0" |       |
| 3854 sqft                                            |                                                                                                                                                                                                                                                                                                      |  | FAN SPEED                          | 1540      | cfm @<br>0.6" w.c.     |                                                                                                                                               |   |   |                               | BCIN# 19669 |               |       |
|                                                      |                                                                                                                                                                                                                                                                                                      |  |                                    |           |                        |                                                                                                                                               |   |   |                               |             | LO#           | 93104 |



CSA-F280-12

SB-12 PERFORMANCE



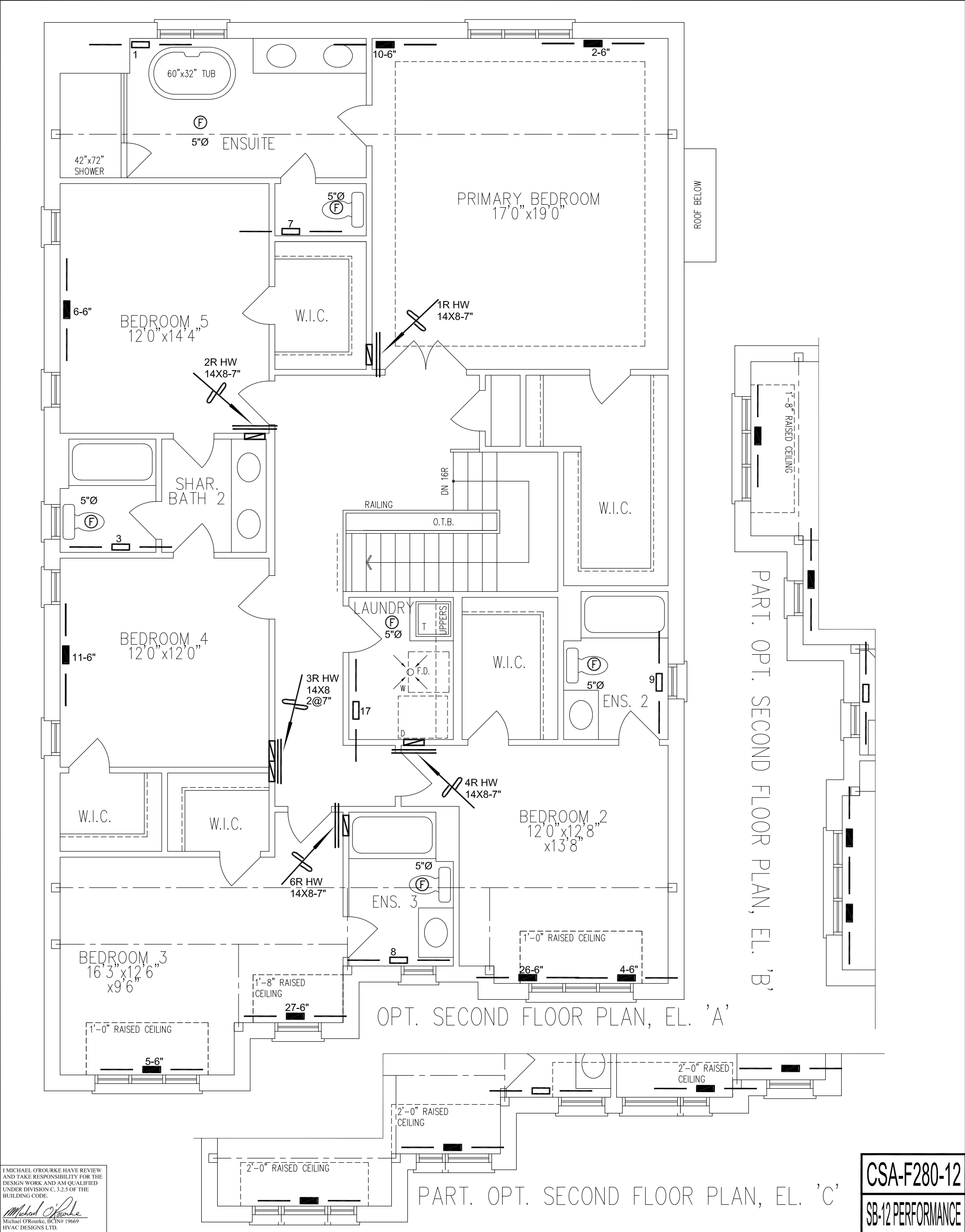
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|             |                           |        |                                 |        |                              |        | REVISIONS                  |     |                             |

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|                                      |  |                                                                                                                                                                                                                                                                                                                                          |                                  |  |
|--------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--|
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| ROYAL PINE HOMES                     |  |                                                                                                                                                                                                                                                                                                                                          | FIRST FLOOR<br>HEATING<br>LAYOUT |  |
| Project Name                         |  | Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper.<br>Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.                                                                               | Date                             |  |
| VALES OF HUMBER<br>BRAMPTON, ONTARIO |  |                                                                                                                                                                                                                                                                                                                                          | OCT/2021                         |  |
| OPT 2ND<br>45-05                     |  |                                                                                                                                                                                                                                                                                                                                          | Scale                            |  |
| 3854 sqft                            |  |                                                                                                                                                                                                                                                                                                                                          | 3/16" = 1'-0"                    |  |
|                                      |  |                                                                                                                                                                                                                                                                                                                                          | BCIN# 19669                      |  |
|                                      |  |                                                                                                                                                                                                                                                                                                                                          | LO# 93104                        |  |



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HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

| HVAC LEGEND |                           |        |                                 |        |                              |        | 3.                         |     |                             |
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|             |                           |        |                                 |        |                              |        | REVISIONS                  |     |                             |

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| ROYAL PINE HOMES                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SECOND FLOOR HEATING LAYOUT |               |
| Project Name                         |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Date                        | OCT/2021      |
| VALES OF HUMBER<br>BRAMPTON, ONTARIO |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Scale                       | 3/16" = 1'-0" |
| OPT 2ND<br>45-05                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | BCIN# 19669                 |               |
| 3854 sqft                            |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | LO#                         | 93104         |