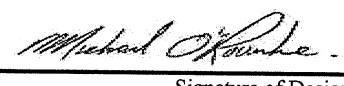


Schedule 1: Designer Information

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

A. Project Information				
Building number, street name			Unit no.	Lot/con.
Municipality BRAMPTON	Postal code	Plan number/ other description		
B. Individual who reviews and takes responsibility for design activities				
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.		
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A	
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdsgns.ca	
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()		
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]				
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems				
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: CELESTIAL 1 LOT 2 Project: GRANELLI HOME CORP		
D. Declaration of Designer				
I <u>MICHAEL O'ROURKE</u>		declare that (choose one as appropriate):		
(print name)				
☐ 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. Individual BCIN: _____ Firm BCIN: _____				
☒ 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. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>				
☐ The design work is exempt from the registration and qualification requirements of the Building Code. 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. 2. I have submitted this application with the knowledge and consent of the firm.				
January 11, 2019				
Date		Signature of Designer		

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: GRANELL HOME CORP										LOT 2		DATE: Jan-19		WINTER NATURAL AIR CHANGE RATE 0.335		HEAT LOSS AT °F. 74		CSA-F280-1							
BUILDER: GREENYORK HOMES										TYPE: CELESTIAL 1		GFA: 3187		LO# 81135		SUMMER NATURAL AIR CHANGE RATE 0.119		SB-42 PACKAGE AT 1							
ROOM USE		EXP. WALL		CLG. HT.		MBR		ENS		WIC		BED-2		BED-3		BED-4		BATH		WIC-2		ENS-2		HEAT GAIN AT °F. 14	
GRS.WALL AREA		FACTORS		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN			
GLAZING		NORTH		20.8		16.3		0		0		0		0		0		0		0		0			
GLAZING		EAST		20.8		41.9		0		0		0		0		0		0		0		0			
GLAZING		SOUTH		20.8		25.2		0		0		0		0		0		0		0		0			
GLAZING		WEST		20.8		41.9		32		565		1340		14		291		586		0		0			
GLAZING		SKYLT.		36.4		102.1		0		0		0		0		0		0		0		0			
GLAZING		DOORS		24.7		4.7		0		0		0		0		0		0		0		0			
GLAZING		NET EXPOSED WALL		4.4		0.8		364		1586		299		218		950		179		63		274			
GLAZING		NET EXPOSED BSMT WALL ABOVE GR		3.5		0.7		0		0		0		0		0		0		0		0			
GLAZING		EXPOSED CLG		1.3		0.6		459		575		279		176		221		107		112		140			
GLAZING		NO ATTIC EXPOSED CLG		2.7		1.3		0		0		0		0		0		0		0		0			
GLAZING		EXPOSED FLOOR		2.5		0.5		0		0		0		0		0		0		0		0			
GLAZING		BASEMENT/CRAWL HEAT LOSS		0		0		0		0		0		0		0		0		0		0			
GLAZING		SLAB ON GRADE HEAT LOSS		0		0		0		0		0		0		0		0		0		0			
GLAZING		SUBTOTAL HT LOSS		2826		1919		0		0		0		0		0		0		0		0			
GLAZING		SUB TOTAL HT GAIN		0.20		0.31		1150		120		1783		2439		1077		590		320		477			
GLAZING		LEVEL FACTOR / MULTIPLIER		867		159		518		127		741		748		330		195		43		409			
GLAZING		AIR CHANGE HEAT LOSS		0		0		0		0		0		0		0		0		0		0			
GLAZING		AIR CHANGE HEAT GAIN		0		0		0		0		0		0		0		0		0		0			
GLAZING		DUCT LOSS		0		0		0		0		0		0		0		0		0		0			
GLAZING		DUCT GAIN		2		480		0		0		1		240		1		240		0		44			
GLAZING		HEAT GAIN PEOPLE		240		536		0		0		536		536		536		536		0		0			
GLAZING		HEAT GAIN APPLIANCES/LIGHTS		3693		4022		2208		542		3470		3188		1407		832		686		633			
GLAZING		TOTAL HT LOSS BTU/H		4022		1620		169		169		3870		3980		1839		450		66		66			
GLAZING		TOTAL HT GAIN x 1.3 BTU/H		1620		169		169		169		3870		3980		1839		450		66		66			
ROOM USE		EXP. WALL		CLG. HT.		LVDN		LIBR		KIT		FAM		LAUN		WIR		FOY		MUD		WUP		BAS	
EXP. WALL		CLG. HT.		LVDN		LIBR		KIT		FAM		LAUN		WIR		FOY		MUD		WUP		BAS			
FACTORS		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN			
GRS.WALL AREA		GLAZING		NORTH		20.8		16.3		0		0		0		0		0		0		0			
GLAZING		EAST		20.8		41.9		0		0		0		0		0		0		0		0			
GLAZING		SOUTH		20.8		25.2		36		748		908		0		0		6		125		251			
GLAZING		WEST		20.8		41.9		0		0		0		0		6		125		151		0			
GLAZING		SKYLT.		36.4		102.1		0		0		0		0		6		125		151		0			
GLAZING		DOORS		24.7		4.7		0		0		0		0		6		125		151		0			
GLAZING		NET EXPOSED WALL		4.4		0.8		283		1233		233		208		906		171		409		986			
GLAZING		NET EXPOSED BSMT WALL ABOVE GR		3.5		0.7		0		0		0		0		0		0		0		0			
GLAZING		EXPOSED CLG		1.3		0.6		0		0		0		0		0		0		0		0			
GLAZING		NO ATTIC EXPOSED CLG		2.7		1.3		0		0		0		0		0		0		0		0			
GLAZING		EXPOSED FLOOR		2.5		0.5		0		0		0		0		0		0		0		0			
GLAZING		BASEMENT/CRAWL HEAT LOSS		0		0		0		0		0		0		0		0		0		0			
GLAZING		SLAB ON GRADE HEAT LOSS		0		0		0		0		0		0		0		0		0		0			
GLAZING		SUBTOTAL HT LOSS		1981		1141		1613		3665		2605		848		434		2013		2432		0			
GLAZING		SUB TOTAL HT GAIN		0.30		0.40		0.30		0.40		0.30		0.20		0.30		0.30		0.40		1190			
GLAZING		LEVEL FACTOR / MULTIPLIER		800		800		651		1480		1052		0.31		0.40		0.30		0.40		225			
GLAZING		AIR CHANGE HEAT LOSS		0		0		0		0		0		0		0		0		0		0			
GLAZING		AIR CHANGE HEAT GAIN		0		0		0		0		0		0		0		0		0		0			
GLAZING		DUCT LOSS		0		0		0		0		0		0		0		0		0		0			
GLAZING		DUCT GAIN		0		0		0		0		0		0		0		0		0		0			
GLAZING		HEAT GAIN PEOPLE		240		536		536		536		536		536		536		536		536		536			
GLAZING		HEAT GAIN APPLIANCES/LIGHTS		2781		2303		2264		5145		3656		1219		609		2825		3414		1190			
GLAZING		TOTAL HT LOSS BTU/H		2781		2303		2264		5145		3656		1219		609		2825		3414		1190			
GLAZING		TOTAL HT GAIN x 1.3 BTU/H		2781		2303		2264		5145		3656		1219		609		2825		3414		1190			
TOTAL HT GAIN BTU/H		TOTAL HT GAIN BTU/H		2781		2303		2264		5145		3656		1219		609		2825		3414		1190			
TOTAL HT GAIN BTU/H		TOTAL HT GAIN BTU/H		2781		2303		2264		5145		3656		1219		609		2825		3414		1190			

TOTAL COMBINED HEAT LOSS BTU/H: 59881

STRUCTURAL HEAT LOSS: 58352

LOSS DUE TO VENTILATION LOAD BTU/H: 1529

TONS: 3.12

37396

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

SITE NAME: GRANELLI HOME CORP
BUILDERS: GREENYORK HOMES

LOT 2

TYPE: CELESTIAL 1

DATE: Jan-19

GFA: 3187 LO# 81135

HEATING CFM 1200
TOTAL HEAT LOSS 58,352
AIR FLOW RATE CFM 20.56

COOLING CFM 1200
TOTAL HEAT GAIN 37,107
AIR FLOW RATE CFM 32.34

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

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

All R/A runs 5'Ø unless noted otherwise on layout.

ROOM NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
MBR	1.85	2.21	0.54	1.74	1.59	1.41	0.83	1.74	1.59	1.85	0.69	2.78	2.26	2.57	2.57	1.83	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
RM LOSS MBH	38	45	11	36	33	29	17	36	33	38	14	57	47	53	53	38	25	13	58	70	104	104	104	104
CFM PER RUN HEAT	2.01	1.62	0.17	1.94	1.99	1.84	0.45	1.94	1.99	2.01	0.63	2.30	2.94	3.01	3.01	1.72	1.21	0.30	0.86	1.34	0.51	0.51	0.51	0.51
RM GAIN MBH	65	52	5	63	64	59	15	63	64	65	20	74	95	97	97	56	39	10	28	43	17	17	17	17
CFM PER RUN COOLING	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	65	34	41	50	55	26	35	63	53	78	55	10	36	31	41	40	41	23	46	37	21	45	17	39
EQUIVALENT LENGTH	160	170	150	150	200	180	170	140	140	150	150	180	130	150	140	150	160	200	160	190	180	190	150	160
TOTAL EFFECTIVE LENGTH	225	204	191	200	255	206	205	203	193	228	205	190	166	181	181	190	201	223	206	227	201	235	167	199
ADJUSTED PRESSURE	0.08	0.08	0.09	0.09	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.1	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.07	0.1	0.08
ROUND DUCT SIZE	5	4	4	5	5	5	4	5	5	5	4	5	6	6	6	5	4	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	279	330	126	264	242	213	195	264	242	279	161	419	240	279	279	279	287	149	426	514	530	530	530	530
COOLING VELOCITY (ft/min)	477	382	57	463	470	433	172	463	470	477	229	543	484	495	495	411	447	115	206	316	87	87	87	87
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	D	C	B	B	D	C	A	D	D	C	B	B	A	D	C	C	D	B	A	D	C

ROOM NAME	25	26	27	28	29	30	31	32
FAM	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
RM LOSS MBH	38	38	38	38	38	38	38	38
CFM PER RUN HEAT	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
RM GAIN MBH	56	56	56	56	56	56	56	56
CFM PER RUN COOLING	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	39	39	39	39	39	39	39
EQUIVALENT LENGTH	170	170	170	170	170	170	170	170
TOTAL EFFECTIVE LENGTH	209	209	209	209	209	209	209	209
ADJUSTED PRESSURE	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
ROUND DUCT SIZE	5	5	5	5	5	5	5	5
HEATING VELOCITY (ft/min)	279	279	279	279	279	279	279	279
COOLING VELOCITY (ft/min)	411	411	411	411	411	411	411	411
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	A	A	A	A	A	A	A

SUPPLY AIR TRUNK SIZE

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	256	0.07	8.7	10	8	TRUNK G	0	0.00	0	0	0
TRUNK B	568	0.07	11.7	16	8	TRUNK H	0	0.00	0	0	0
TRUNK C	288	0.07	9.1	10	8	TRUNK I	0	0.00	0	0	0
TRUNK D	633	0.07	12.2	18	8	TRUNK J	0	0.00	0	0	0
TRUNK E	0	0.00	0	0	0	TRUNK K	0	0.00	0	0	0
TRUNK F	0	0.00	0	0	0	TRUNK L	0	0.00	0	0	0

RETURN AIR

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	175	0.15	95	75	175	TRUNK G	0	0.00	0	0	0
TRUNK B	50	0.08	38	28	50	TRUNK H	0	0.00	0	0	0
TRUNK C	135	0.15	175	255	145	TRUNK I	0	0.00	0	0	0
TRUNK D	185	0.21	271	317	175	TRUNK J	0	0.00	0	0	0
TRUNK E	0.08	0.07	6	6	0.08	TRUNK K	0	0.00	0	0	0
TRUNK F	8	0.08	8	8	8	TRUNK L	0	0.00	0	0	0
TRUNK G	14	0.14	14	14	14	TRUNK M	0	0.00	0	0	0

TYPE: CELESTIAL 1
SITE NAME: GRANELLI HOME CORP

LO # 81135
LOT 2

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY
COMBUSTION APPLIANCES 9.32.3.1(1)
a) ☒ Direct vent (sealed combustion) only
b) ☐ Positive venting induced draft (except fireplaces)
c) ☐ Natural draft, B-vent or induced draft gas fireplace
d) ☐ Solid Fuel (including fireplaces)
e) ☐ No Combustion Appliances

HEATING SYSTEM
☒ Forced Air ☐ Non Forced Air
☐ Electric Space Heat

HOUSE TYPE 9.32.1(2)
☒ I Type a) or b) appliance only, no solid fuel
☐ II Type I except with solid fuel (including fireplaces)
☐ III Any Type c) appliance
☐ IV Type I, or II with electric space heat
☐ Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.
☐ 1 Exhaust only/Forced Air System
☐ 2 HRV with Ducting/Forced Air System
☒ 3 HRV Simplified/connected to forced air system
☐ 4 HRV with Ducting/non forced air system
☐ Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

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

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
TOTAL		79.5	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

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

PRINCIPAL EXHAUST FAN CAPACITY
Model: LIFE BREATH RNC5-HEX Location: BSMT
79.5 cfm 3.0 sones ☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM	ΔT °F	FACTOR	% LOSS
79.5 CFM	X	74 F	X
		1.08	X
			0.24

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	☒	0.3
BATH	QTXEN050C	50	☒	0.3
ENS-2	QTXEN050C	50	☒	0.3
W/R	QTXEN050C	50	☒	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.
Model: LIFE BREATH RNC5-HEX
108 cfm high 59 cfm low
76 % Sensible Efficiency @ 32 deg F (0 deg C) ☒ HVI Approved

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

BUILDER: GREENYORK HOMES
Name:
Address:
City:
Telephone #: Fax #:

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

DESIGNER CERTIFICATION
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.
Name: HVAC Designs Ltd.
Signature: *Michael O'Rourke*
HRAI # 001820
Date: January-19

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: CELESTIAL 1	LOT 2	BUILDER: GREENYORK HOMES
SFQT: 3187	LO# 81135	SITE: GRANELLI HOME CORP

DESIGN ASSUMPTIONS

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

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	44655.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 56.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	186.0 ft

2012 OBC - COMPLIANCE PACKAGE

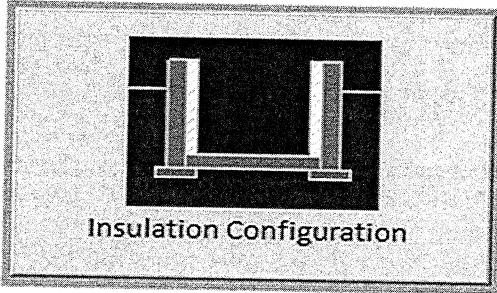
Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	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):	17.1	 Insulation Configuration
Floor Width (m):	11.3	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	0.8	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	1904	

TYPE: CELESTIAL 1
LO# 81135

LOT 2

Air Infiltration Residential Load Calculator

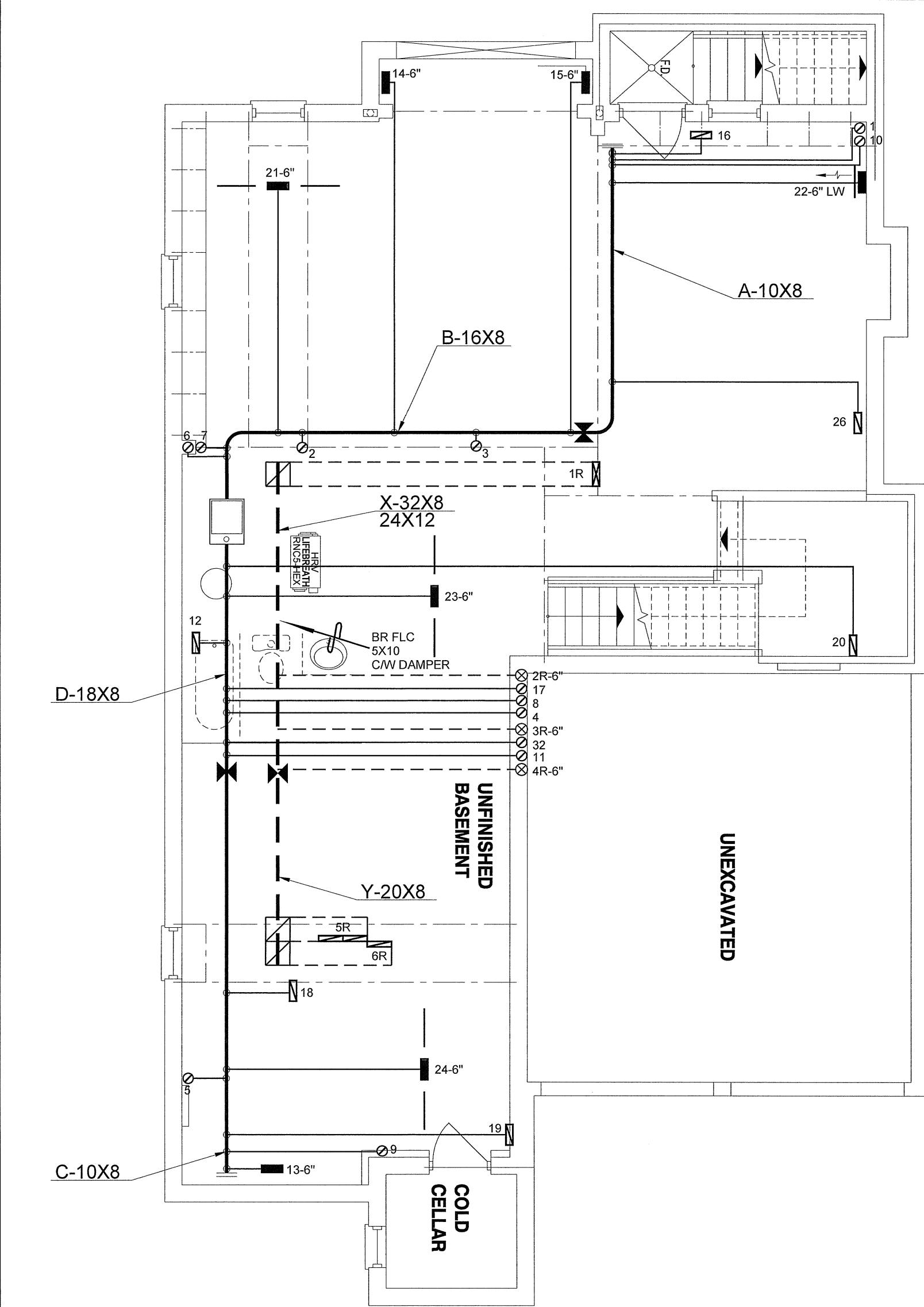
Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Brampton			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	7.01			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1264.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1685.6 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	37.5	37.5		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.335			
Cooling Air Leakage Rate (ACH/H):	0.119			

TYPE: CELESTIAL 1
LO# 81135

LOT 2

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																															
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																															
LO#: 81135	Model: CELESTIAL 1	Builder: GREENYORK HOMES	Date: 1/11/2019																																																												
Volume Calculation		Air Change & Delta T Data																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> <tr> <td>Bsmt</td> <td>1452</td> <td>9</td> <td>13068</td> </tr> <tr> <td>First</td> <td>1452</td> <td>11</td> <td>15972</td> </tr> <tr> <td>Second</td> <td>1735</td> <td>9</td> <td>15615</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="2" style="text-align: right;">Total:</td> <td></td> <td>44,655.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1264.5 m³</td> </tr> </table>		Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1452	9	13068	First	1452	11	15972	Second	1735	9	15615	Third	0	9	0	Fourth	0	9	0	Total:			44,655.0 ft³	Total:			1264.5 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> </tr> <tr> <td>Winter DTDh</td> <td>22</td> <td>-19</td> <td>41</td> </tr> <tr> <td>Summer DTDc</td> <td>22</td> <td>30</td> <td>8</td> </tr> <tr> <td></td> <td></td> <td></td> <td>ΔT °F</td> </tr> <tr> <td></td> <td></td> <td></td> <td>74</td> </tr> <tr> <td></td> <td></td> <td></td> <td>14</td> </tr> </table>		Design Temperature Difference					Tin °C	Tout °C	ΔT °C	Winter DTDh	22	-19	41	Summer DTDc	22	30	8				ΔT °F				74				14
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5.2.3.1 Heat Loss due to Air Leakage		6.2.6 Sensible Gain due to Air Leakage																																																													
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$		$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																													
0.335 x 351.25 x 41 °C x 1.2 = 5816 W = 19843 Btu/h		= 0.119 x 351.25 x 8 °C x 1.2 = 389 W = 1327 Btu/h																																																													
5.2.3.2 Heat Loss due to Mechanical Ventilation		6.2.7 Sensible heat Gain due to Ventilation																																																													
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$		$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																													
80 CFM x 74 °F x 1.08 x 0.24 = 1529 Btu/h		80 CFM x 14 °F x 1.08 x 0.24 = 288 Btu/h																																																													
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																															
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																															
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*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																															



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

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

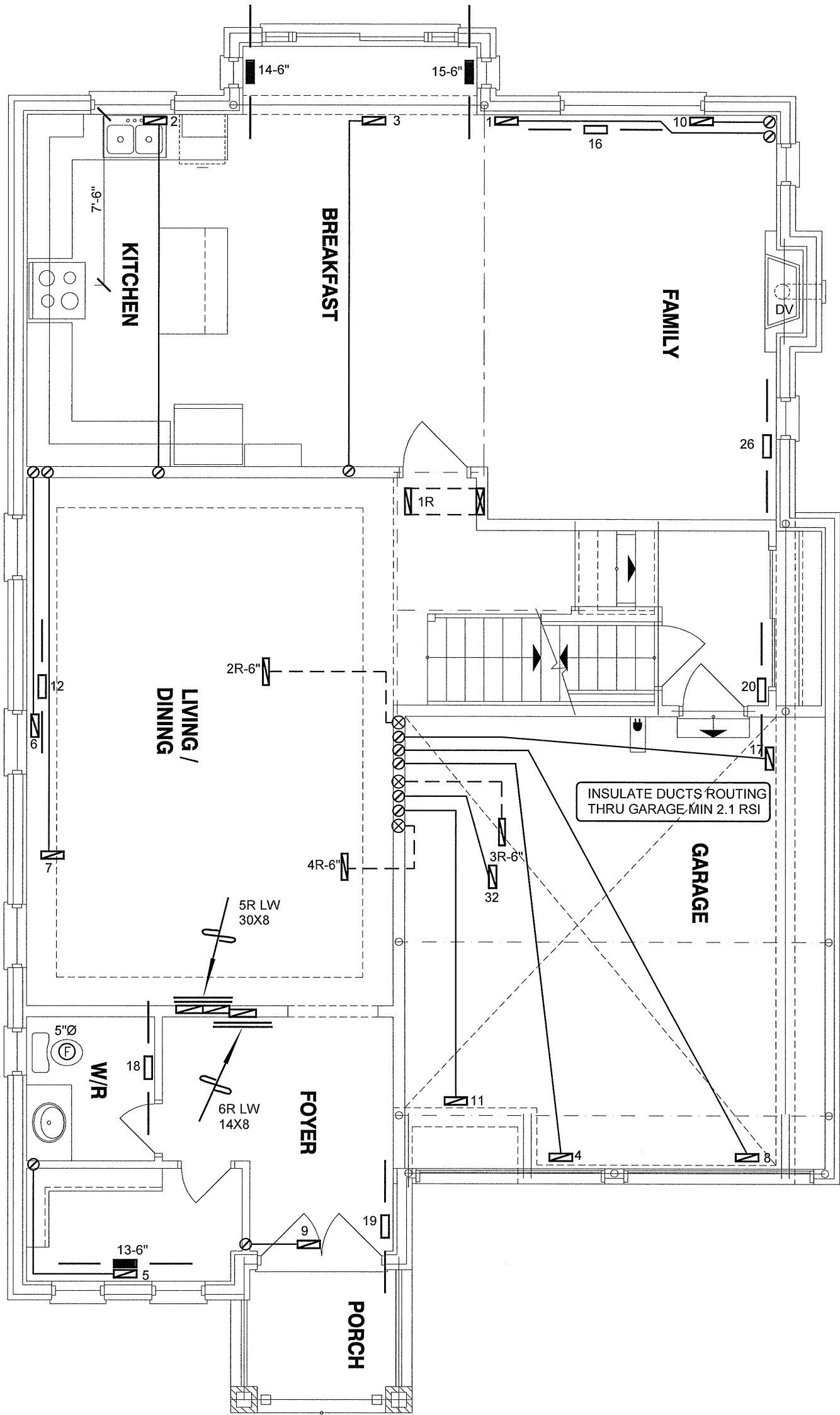
CSA-F280-12

LOT 2 PACKAGE A1

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

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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 59881 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title	
GREENYORK HOMES			MAKE CARRIER		3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name GRANELLI HOMES CORP BRAMPTON, ONTARIO			MODEL 59SP5A-80-16-80		2ND FLOOR 13 4 3					
			INPUT 80 MBTU/H		1ST FLOOR 9 2 2					
LOT 2 CELESTIAL 1 3187 sqft			OUTPUT 78 MBTU/H		BASEMENT 4 1 0				Date JAN/2019	
			COOLING 3.0 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"	
			FAN SPEED 1200 cfm @ 0.6" w.c.						BCIN# 19669	
										LO# 81135



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

CSA-F280-12

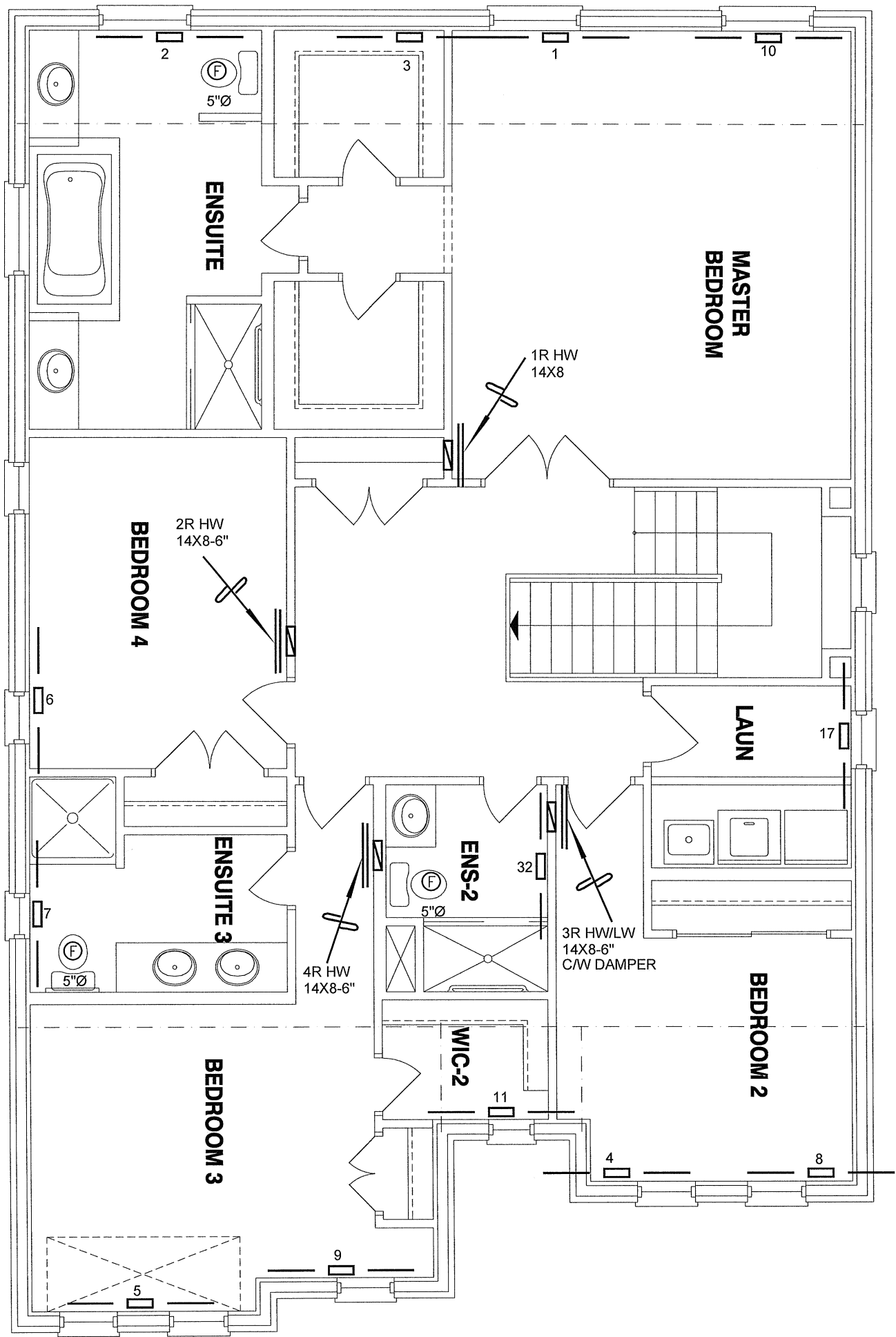
LOT 2

PACKAGE A1

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.		
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Client		HVAC DESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title	
GREENYORK HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	JAN/2019
GRANELLI HOMES CORP BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
LOT 2			BCIN# 19669	
CELESTIAL 1	3187 sqft	LO#	81135	



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

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

CSA-F280-12

LOT 2 PACKAGE A1

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.		
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GREENYORK HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name GRANELLI HOMES CORP BRAMPTON, ONTARIO			Date	JAN/2019
			Scale	3/16" = 1'-0"
LOT 2 CELESTIAL 1		BCIN# 19669		
3187 sqft		LO#	81135	