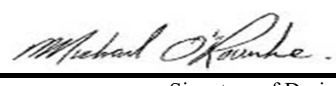


Schedule 1: Designer Information

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 VAUGHAN (WOODBIDGE)	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@hvacdesigns.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: 4203- THE FORESTCREST Project: PINE VALLEY & TESTON	
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.			
February 24, 2020		 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: PINE VALLEY & TESTON		TYPE: 4203- THE FORESTCREST		GFA: 3688		DATE: Feb-20		WINTER NATURAL AIR CHANGE RATE 0.340		HEAT LOSS ΔT °F. 76		CSA-F280-12	
BUILDER: GOLD PARK HOMES						LO# 77467		SUMMER NATURAL AIR CHANGE RATE 0.124		HEAT GAIN ΔT °F. 16		SB-12 PACKAGE A1	
ROOM USE		MBR	ENS	HERS	BED-2	BED-3	BED-4	ENS-2	LOFT	ENS-3	ENS-4		
EXP. WALL		38	37	7	12	33	48	6	7	9	8		
CLG. HT.		9	9	9	12	9	9	9	9	9	9		
FACTORS													
GRS.WALL AREA	LOSS GAIN	342	333	63	144	297	432	54	63	81	72		
GLAZING	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN		
NORTH	21.3 16.8	0 0 0	0 0 0	0 0 0	18 383 303	0 0 0	0 0 0	8 170 135	0 0 0	8 170 135	0 0 0		
EAST	21.3 42.4	0 0 0	0 0 0	0 0 0	0 0 0	61 1298 2586	61 1298 2586	0 0 0	0 0 0	0 0 0	14 298 593		
SOUTH	21.3 25.7	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	18 383 463	0 0 0	0 0 0		
WEST	21.3 42.4	44 936 1865	21 447 890	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		
SKYLT.	37.2 103.0	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	25.2 5.2	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		
NET EXPOSED WALL	4.5 0.9	298 1330 276	312 1392 289	63 281 58	126 562 117	236 1053 219	371 1656 344	46 205 43	45 201 42	73 326 68	58 259 54		
NET EXPOSED BSMT WALL ABOVE GR	3.6 0.7	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		
EXPOSED CLG	1.3 0.6	357 458 228	280 359 179	91 117 58	252 323 161	204 262 130	210 270 134	120 154 77	100 128 64	100 128 64	100 128 64		
NO ATTIC EXPOSED CLG	2.7 1.4	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	30 82 41	0 0 0	0 0 0	0 0 0	0 0 0		
EXPOSED FLOOR	2.6 0.5	0 0 0	0 0 0	0 0 0	0 0 0	204 520 108	0 0 0	0 0 0	0 0 0	50 128 27	100 255 53		
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0	0	0	0	0	0		
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0	0	0		
SUBTOTAL HT LOSS		2724	2199	398	1269	3133	3306	530	712	752	940		
SUB TOTAL HT GAIN		2370	1358	117	580	3043	3105	254	569	293	764		
LEVEL FACTOR / MULTIPLIER	0.20 0.31												
AIR CHANGE HEAT LOSS	854		690	125	398	983	1037	166	223	236	295		
AIR CHANGE HEAT GAIN	252		144	12	62	323	330	27	60	31	81		
DUCT LOSS	0		0	0	0	412	0	0	0	99	123		
DUCT GAIN	0		0	0	0	423	0	0	0	32	85		
HEAT GAIN PEOPLE	240	2	480	0	0	1	240	1	240	0	0		
HEAT GAIN APPLIANCES/LIGHTS			625	0	0	625	625	0	625	0	0		
TOTAL HT LOSS BTU/H		3579	2888	523	1667	4528	4342	696	936	1086	1358		
TOTAL HT GAIN x 1.3 BTU/H		4845	1954	168	1960	6052	5591	365	1631	463	1209		

ROOM USE		DIN	LIV	KT/GT	STUDY	LAUN	PWD	FOY	MUD		LOD	BAS
EXP. WALL		12	21	75	10	0	6	51	26		43	198
CLG. HT.		11	20	11	11	9	11	11	12		10	10
FACTORS												
GRS.WALL AREA	LOSS GAIN	132	420	825	110	0	66	561	312		430	1644
GLAZING	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN		LOSS GAIN	LOSS GAIN
NORTH	21.3 16.8	32 681 538	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0	4 85 67
EAST	21.3 42.4	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0	0 0 0
SOUTH	21.3 25.7	0 0 0	74 1575 1905	0 0 0	20 426 515	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0	4 85 103
WEST	21.3 42.4	0 0 0	0 0 0	98 2085 4154	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		35 745 1484	0 0 0
SKYLT.	37.2 103.0	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	25.2 5.2	0 0 0	0 0 0	20 505 105	0 0 0	0 0 0	0 0 0	52 1313 273	20 505 105		0 0 0	20 505 105
NET EXPOSED WALL	4.5 0.9	100 446 93	346 1544 321	707 3155 656	90 402 83	0 0 0	66 295 61	509 2272 472	292 1303 271		0 0 0	0 0 0
NET EXPOSED BSMT WALL ABOVE GR	3.6 0.7	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		223 802 167	336 1209 251
EXPOSED CLG	1.3 0.6	0 0 0	231 296 147	0 0 0	0 0 0	130 167 83	0 0 0	0 0 0	0 0 0		0 0 0	0 0 0
NO ATTIC EXPOSED CLG	2.7 1.4	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		0 0 0	0 0 0
EXPOSED FLOOR	2.6 0.5	0 0 0	0 0 0	0 0 0	0 0 0	60 153 32	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	6659
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0		0	
SUBTOTAL HT LOSS		1127	3415	5746	827	320	295	3584	1808		1547	8543
SUB TOTAL HT GAIN		631	2373	4915	598	115	61	745	376		1651	527
LEVEL FACTOR / MULTIPLIER	0.30 0.46											
AIR CHANGE HEAT LOSS	514		1557	2619	377	100	134	1634	824		0.50 1.27	12766
AIR CHANGE HEAT GAIN	67		252	522	64	12	7	79	40			231
DUCT LOSS	0		0	0	0	42	0	0	0			0
DUCT GAIN	0		0	0	0	75	0	0	0			0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0		0	0
HEAT GAIN APPLIANCES/LIGHTS			625	625	625	625	625	0	625		0	625
TOTAL HT LOSS BTU/H		1641	4972	8365	1204	462	429	5218	2632		1547	21309
TOTAL HT GAIN x 1.3 BTU/H		1720	4226	7882	1673	1076	88	1072	1354		2146	1798

TOTAL HEAT GAIN BTU/H: 47931

TONS: 3.99

LOSS DUE TO VENTILATION LOAD BTU/H: 3181

STRUCTURAL HEAT LOSS: 69382

TOTAL COMBINED HEAT LOSS BTU/H: 72563

Michael O'Rourke

SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

TYPE: 4203- THE FORESTCREST

DATE: Feb-20

GFA: 3688

LO# 77467

HEATING CFM 1525 COOLING CFM 1525
TOTAL HEAT LOSS 69,382 TOTAL HEAT GAIN 47,270
AIR FLOW RATE CFM 21.98 AIR FLOW RATE CFM 32.26

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

*LENNOX
EL296UH090XE48C

FAN SPEED 90

AFUE = 96 %
INPUT (BTU/H) = 88,000
OUTPUT (BTU/H) = 85,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	10	5
R/A	0	0	5	4	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.03 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.15 adjusted pressure r/a 0.15

LOW 0
MEDLOW 0
MEDIUM 1105
MEDIUM HIGH 1255
HIGH 1525

DESIGN CFM = 1525
CFM @ .6" E.S.P.

TEMPERATURE RISE 52 °F

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	ENS-2	LOFT	ENS-3	MBR	ENS-4	DIN	LIV	KT/GT	KT/GT	STUDY	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.79	1.44	1.44	1.67	2.26	2.17	0.70	0.94	1.09	1.79	1.36	1.64	2.49	2.79	2.79	1.20	0.46	0.43	5.22	2.63	4.57	4.57	4.57	4.57
CFM PER RUN HEAT	39	32	32	37	50	48	15	21	24	39	30	36	55	61	61	26	10	9	115	58	100	100	100	100
RM GAIN MBH	2.42	0.98	0.98	1.96	3.03	2.80	0.36	1.63	0.46	2.42	1.21	1.72	2.11	2.63	2.63	1.67	1.08	0.09	1.07	1.35	0.79	0.79	0.79	0.79
CFM PER RUN COOLING	78	32	32	63	98	90	12	53	15	78	39	55	68	85	85	54	35	3	35	44	25	25	25	25
ADJUSTED PRESSURE	0.17	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	0.16	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	46	62	72	29	47	64	21	53	42	41	42	8	28	57	49	35	32	43	55	8	48	33	24	46
EQUIVALENT LENGTH	130	160	140	160	150	170	140	180	190	130	120	90	150	130	120	140	110	140	120	130	130	90	150	110
TOTAL EFFECTIVE LENGTH	176	222	212	189	197	234	161	233	232	171	162	98	178	187	169	175	142	183	175	138	178	123	174	156
ADJUSTED PRESSURE	0.1	0.08	0.08	0.09	0.08	0.07	0.11	0.07	0.07	0.1	0.11	0.18	0.1	0.09	0.1	0.1	0.12	0.09	0.09	0.12	0.09	0.13	0.09	0.1
ROUND DUCT SIZE	5	4	4	5	6	6	4	5	4	5	4	4	5	5	5	4	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	286	367	367	272	255	245	172	154	275	286	344	413	404	448	448	298	115	103	586	665	510	510	510	510
COOLING VELOCITY (ft/min)	573	367	367	463	500	459	138	389	172	573	447	631	499	624	624	620	402	34	178	505	127	127	127	127
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	A	A	D	C	B	D	A	C	E	C	D	B	A	A	A	C	B	B	E	A	E	B	B

RUN #	25	26	27	28	29	30
ROOM NAME	BED-3	BED-4	KT/GT	LIV	HERS	BAS
RM LOSS MBH	2.26	2.17	2.79	2.49	0.52	4.57
CFM PER RUN HEAT	50	48	61	55	11	100
RM GAIN MBH	3.03	2.80	2.63	2.11	0.17	0.79
CFM PER RUN COOLING	98	90	85	68	5	25
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.17	0.16
ACTUAL DUCT LGH	49	66	41	31	73	12
EQUIVALENT LENGTH	170	130	90	130	180	120
TOTAL EFFECTIVE LENGTH	219	196	131	161	253	132
ADJUSTED PRESSURE	0.07	0.08	0.12	0.11	0.07	0.12
ROUND DUCT SIZE	6	6	5	5	4	6
HEATING VELOCITY (ft/min)	255	245	448	404	126	510
COOLING VELOCITY (ft/min)	500	459	624	499	57	127
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	4X10
TRUNK	C	B	C	B	A	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	344	0.07	9.7	12	x 8	516	TRUNK G	0	0.00	0	0 x 8 0
TRUNK B	530	0.07	11.4	16	x 8	596	TRUNK H	0	0.00	0	0 x 8 0
TRUNK C	1138	0.07	14.9	26	x 8	788	TRUNK I	0	0.00	0	0 x 8 0
TRUNK D	188	0.09	7.3	8	x 8	423	TRUNK J	0	0.00	0	0 x 8 0
TRUNK E	1335	0.07	16.2	30	x 8	801	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

	TRUNK	STATIC	ROUND	RECT	VELOCITY
	CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK O	0	0.06	0	0	x 8 0
TRUNK P	0	0.06	0	0	x 8 0
TRUNK Q	0	0.06	0	0	x 8 0
TRUNK R	0	0.06	0	0	x 8 0
TRUNK S	0	0.06	0	0	x 8 0
TRUNK T	0	0.06	0	0	x 8 0
TRUNK U	0	0.06	0	0	x 8 0
TRUNK V	0	0.06	0	0	x 8 0
TRUNK W	0	0.06	0	0	x 8 0
TRUNK X	1525	0.06	17.7	32	x 10 686
TRUNK Y	485	0.06	11.5	16	x 8 546
TRUNK Z	915	0.06	14.6	24	x 8 686
DROP	1525	0.06	17.7	24	x 14 654

RETURN AIR #	1	2	3	4	5	6	7	8	9	BR
AIR VOLUME	175	125	125	130	155	175	155	155	125	0 205
PLENUM PRESSURE	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	48	46	47	56	47	32	23	33	48	1 1 1 1 14
EQUIVALENT LENGTH	165	185	205	145	200	195	205	195	190	0 0 0 0 145
TOTAL EFFECTIVE LH	213	231	252	201	247	227	228	228	238	1 1 1 1 159
ADJUSTED PRESSURE	0.07	0.06	0.06	0.07	0.06	0.07	0.06	0.06	0.06	14.80 14.80 14.80 14.80 14.80 0.09
ROUND DUCT SIZE	7.5	6.9	6.9	6.8	7.5	7.5	7.5	6.9	0	0 0 0 0 7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0 0 0 0 8
	X	X	X	X	X	X	X	X	X	X X X X X
INLET GRILL SIZE	14	14	14	14	14	14	14	14	0	0 0 0 0 14

TYPE: 4203- THE FORESTCREST
SITE NAME: PINE VALLEY & TESTON

LO # 77467

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	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>8</u> @ 10.6 cfm	<u>84.8</u> cfm
Table 9.32.3.A.	TOTAL	<u>222.6</u> cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		<u>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>222.6</u>	cfm
Less Principal Ventil. Capacity	<u>155</u>	cfm
Required Supplemental Capacity	<u>67.6</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model:	VANEE 65H		
Location:	BSMT		
<u>155.0</u> cfm	<u>3.0</u> sones		
☒ HVI Approved			
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
155.0 CFM	X 76 F	X 1.08	X 0.25

SUPPLEMENTAL FANS		NUTONE		
Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	☒	0.3
ENS-2	QTXEN050C	50	☒	0.3
ENS-4	QTXEN050C	50	☒	0.3
PWD	QTXEN050C	50	☒	0.3

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model:	VANEE 65H	
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER:	
GOLD PARK HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

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

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	February-20

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 77467	Model: 4203- THE FORESTCREST	Builder: GOLD PARK HOMES	Date: 2/24/2020																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <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>1728</td> <td>10</td> <td>17280</td> </tr> <tr> <td>First</td> <td>1728</td> <td>11</td> <td>19008</td> </tr> <tr> <td>Second</td> <td>2103</td> <td>9</td> <td>18927</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>55,215.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1563.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1728	10	17280	First	1728	11	19008	Second	2103	9	18927	Third	0	9	0	Fourth	0	9	0	Total:			55,215.0 ft³	Total:			1563.5 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%; text-align: center;">0.340</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.124</td> </tr> </table> <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 style="text-align: center;">22</td> <td style="text-align: center;">-20</td> <td style="text-align: center;">42</td> <td style="text-align: center;">76</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">22</td> <td style="text-align: center;">31</td> <td style="text-align: center;">9</td> <td style="text-align: center;">16</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.340	SUMMER NATURAL AIR CHANGE RATE	0.124	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-20	42	76	Summer DTDc	22	31	9	16
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.340 x 434.31 x 42 °C x 1.2 = 7483 W = 25532 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.124 x 434.31 x 9 °C x 1.2 = 567 W = 1936 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 16 °F x 1.08 x 0.25 = 661 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	25,532	10,090	1.265																																																								
2	0.3		16,802	0.456																																																								
3	0.2		16,282	0.314																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET**MODEL:** 4203- THE FORESTCREST**BUILDER:** GOLD PARK HOMES**SFQT:** 3688**LO#** 77467**SITE:** PINE VALLEY & TESTON**DESIGN ASSUMPTIONS**

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
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 (ft ³):	55215.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.35	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 66.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	198.0 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	-

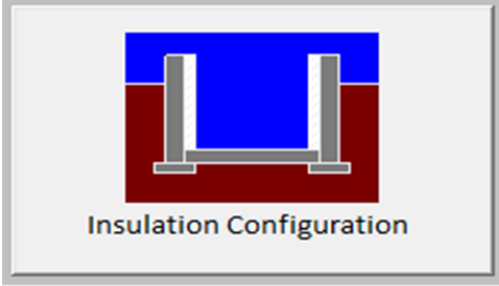
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	20.1	 Insulation Configuration
Floor Width (m):	10.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	4.0	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1951

TYPE: 4203- THE FORESTCREST
LO# 77467

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Vaughan (Woodbridge)			
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):	1563.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2084.2 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	73.2	73.2		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.340			
Cooling Air Leakage Rate (ACH/H):	0.124			

TYPE: 4203- THE FORESTCREST
LO# 77467

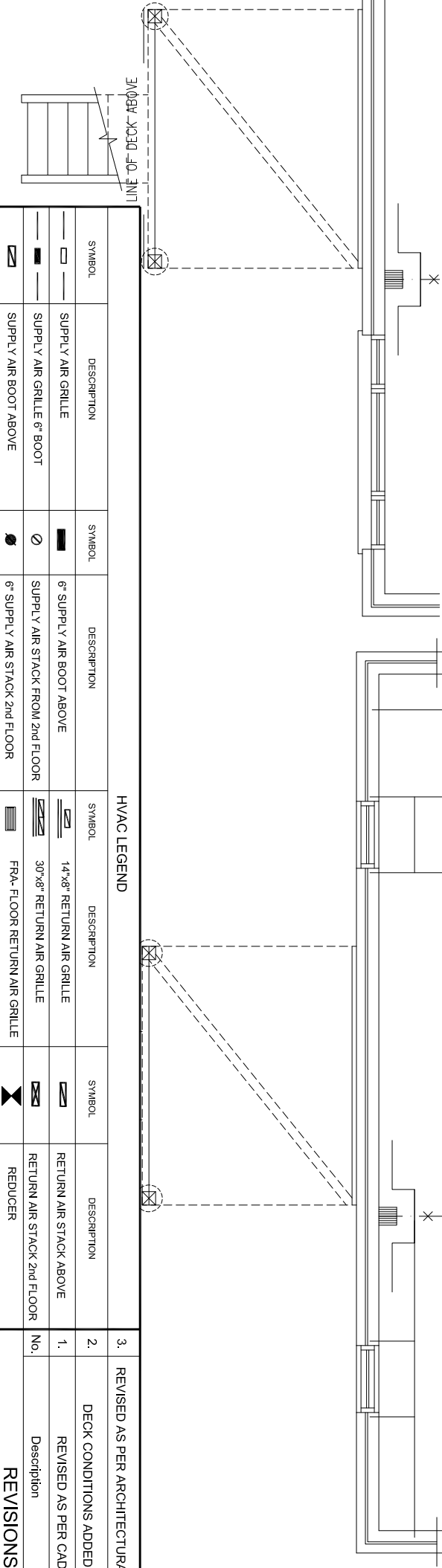
CSA-F280-12

PACKAGE A1

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.

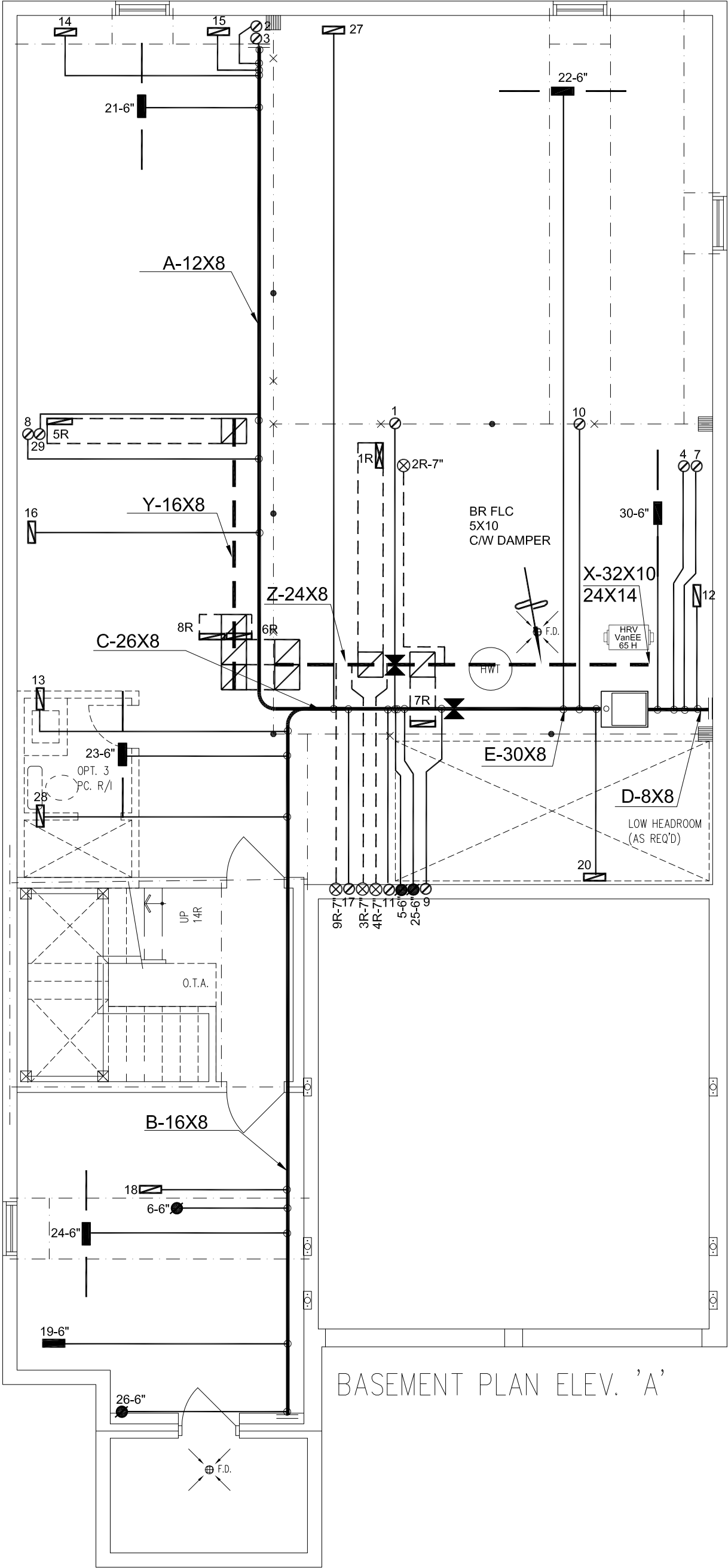
Michael O'Rourke

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



PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.

PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



BASEMENT PLAN ELEV. 'A'

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Client

GOLD PARK HOMES

Project Name

PINE VALLEY & TESTON VAUGHAN, ONTARIO

THE FORESTCREST

4203

3688 sqft

HVACDESIGNS LTD.

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

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

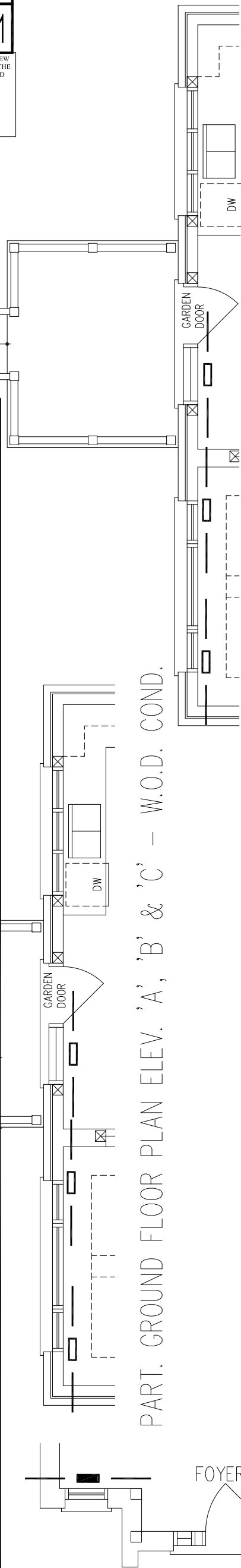
HEAT LOSS 72563 BTU/H UNIT DATA		# OF RUNS	S/A	R/A	FANS
MAKE	LENNOX	3RD FLOOR			
MODEL	EL296UH090XE48C	2ND FLOOR	15	5	6
INPUT	88 MBTU/H	1ST FLOOR	10	4	2
OUTPUT	85 MBTU/H	BASEMENT	5	1	0
COOLING	4.0 TONS	ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A			
FAN SPEED	1525 cfm @ 0.6" w.c.				

BASEMENT HEATING LAYOUT	
Date	JAN/2018
Scale	3/16" = 1'-0"
BCIN# 19669	
LO#	77467

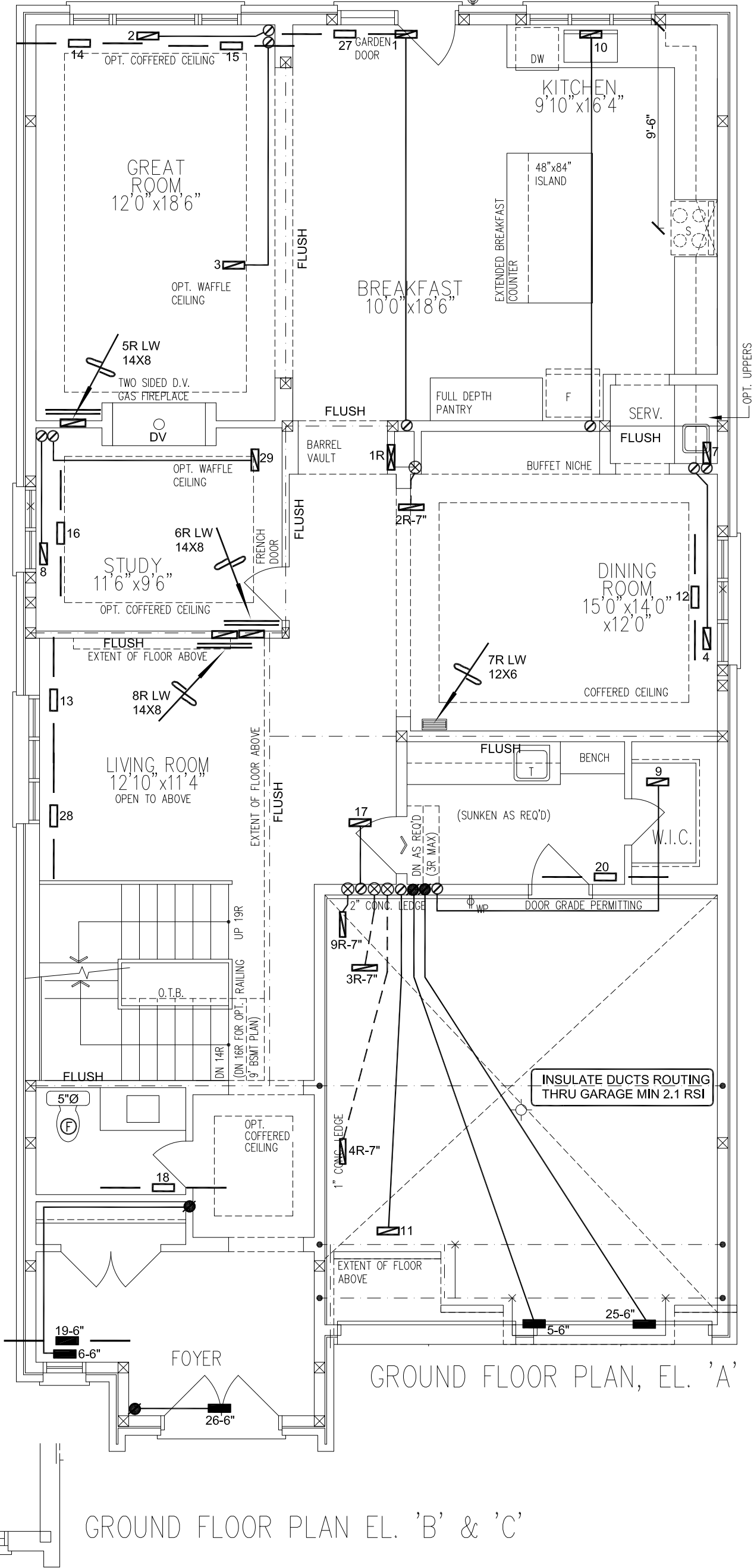
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Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND										3.	REVISED AS PER ARCHITECTURALS	FEB/2020
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	DECK CONDITIONS ADDED	SEPT/2018		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED AS PER CAD	JULY/2018		
	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				



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.



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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	Sheet Title
GOLD PARK HOMES		FIRST FLOOR HEATING LAYOUT
Project Name		Date
PINE VALLEY & TESTON VAUGHAN, ONTARIO		JAN/2018
		Scale
		3/16" = 1'-0"
		BCIN# 19669
THE FORESTCREST 4203	3688 sqft	LO#
		77467

CSA-F280-12

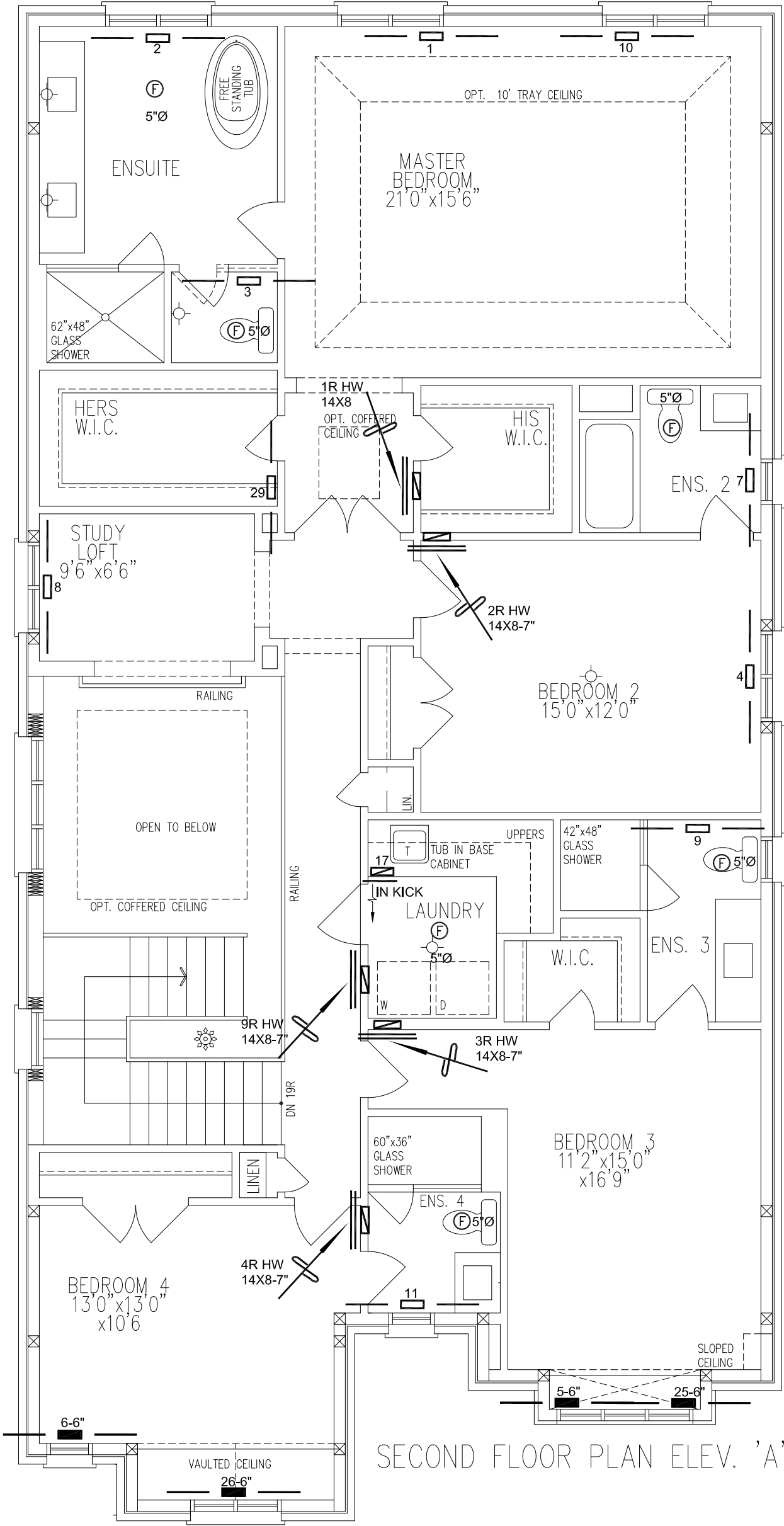
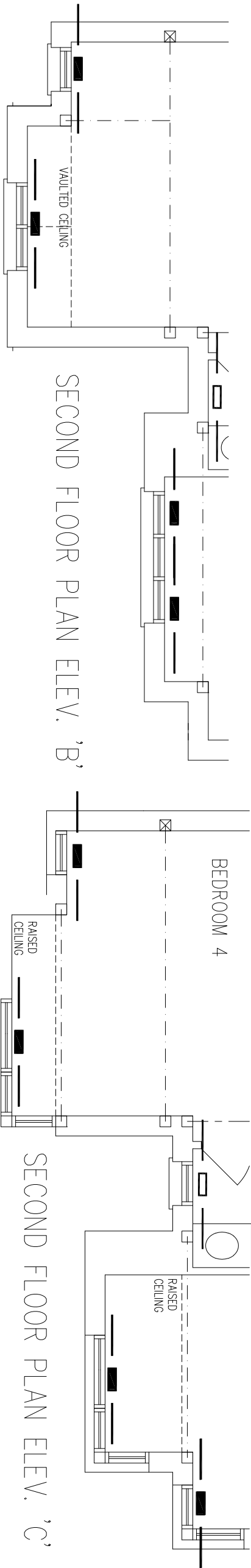
PACKAGE A1

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Michael O'Rourke

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

SYMBOL		DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	3.
		SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK ABOVE		6" SUPPLY AIR STACK 2nd FLOOR	REVIS AS PER ARCHITECTURALS
		SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		30"x8" RETURN AIR GRILLE	2. DECK CONDITIONS ADDED
		SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		30"x8" RETURN AIR GRILLE		30"x8" RETURN AIR GRILLE	1. REVISED AS PER CAD
		SUPPLY AIR STACK 2nd FLOOR		6" SUPPLY AIR STACK 2nd FLOOR		30"x8" RETURN AIR GRILLE		30"x8" RETURN AIR GRILLE	REVISIONS
		SUPPLY AIR STACK 2nd FLOOR		6" SUPPLY AIR STACK 2nd FLOOR		30"x8" RETURN AIR GRILLE		30"x8" RETURN AIR GRILLE	Date
		SUPPLY AIR STACK 2nd FLOOR		6" SUPPLY AIR STACK 2nd FLOOR		30"x8" RETURN AIR GRILLE		30"x8" RETURN AIR GRILLE	FEB/2020



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Client	GOLD PARK HOMES
Project Name	PINE VALLEY & TESTON VAUGHAN, ONTARIO
	THE FORESTCREST 4203 3688 sqft

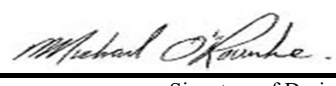
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Email: info@hvacdsgns.ca
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Specializing in Residential Mechanical Design Services

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	SECOND FLOOR HEATING LAYOUT
Date	JAN/2018
Scale	3/16" = 1'-0"
	BCIN# 19669
LO#	77467

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 VAUGHAN (WOODBIDGE)	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@hvacdesigns.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: 4203- THE FORESTCREST OPT. 5 BED Project: PINE VALLEY & TESTON	
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.			
February 24, 2020		 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: PINE VALLEY & TESTON										OPT. 5 BED										DATE: Feb-20										WINTER NATURAL AIR CHANGE RATE 0.340										HEAT LOSS ΔT °F. 76										CSA-F280-12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
BUILDER: GOLD PARK HOMES										TYPE: 4203- THE FORESTCREST										GFA: 3688										LO# 77468										SUMMER NATURAL AIR CHANGE RATE 0.124										HEAT GAIN ΔT °F. 16										SB-12 PACKAGE A1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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ROOM USE			DIN			LIV			KT/GT			STUDY			LAUN			PWD			FOY			MUD									LOD			BAS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

OPT. 5 BED
TYPE: 4203- THE FORESTCREST

DATE: Feb-20

GFA: 3688

LO# 77468

HEATING CFM 1525 COOLING CFM 1525
TOTAL HEAT LOSS 69,988 TOTAL HEAT GAIN 47,329
AIR FLOW RATE CFM 21.79 AIR FLOW RATE CFM 32.22

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

^LENNOX
EL296UH090XE48C

AFUE = 96 %
INPUT (BTU/H) = 88,000
OUTPUT (BTU/H) = 85,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	10	6
R/A	0	0	6	4	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.03 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.15 adjusted pressure r/a 0.15

FAN SPEED 90
LOW 0
MEDLOW 0
MEDIUM 1105
MEDIUM HIGH 1255
HIGH 1525

DESIGN CFM = 1525
CFM @ .6" E.S.P.

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	HERS	ENS-5	ENS-3	MBR	ENS-4	DIN	LIV	KT/GT	KT/GT	STUDY	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.77	1.43	1.43	1.65	2.24	2.14	0.53	0.61	1.08	1.77	1.35	1.64	2.49	2.79	2.79	1.20	0.46	0.43	5.22	2.63	3.81	3.81	3.81	3.81
CFM PER RUN HEAT	39	31	31	36	49	47	12	13	23	39	29	36	54	61	61	26	10	9	114	57	83	83	83	83
RM GAIN MBH	2.43	0.98	0.98	1.98	3.04	2.79	0.19	0.42	0.46	2.43	1.21	1.74	2.12	2.63	2.63	1.69	1.10	0.09	1.07	0.54	0.66	0.66	0.66	0.66
CFM PER RUN COOLING	78	31	31	64	98	90	6	14	15	78	39	56	68	85	85	55	35	3	34	17	21	21	21	21
ADJUSTED PRESSURE	0.17	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	0.16	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	46	62	72	29	47	64	35	53	42	41	42	8	28	57	49	35	32	43	55	8	48	33	24	46
EQUIVALENT LENGTH	130	160	140	160	150	170	140	180	190	130	120	90	150	130	120	140	110	140	120	130	130	90	160	110
TOTAL EFFECTIVE LENGTH	176	222	212	189	197	234	175	233	232	171	162	98	178	187	169	175	142	183	175	138	178	123	184	156
ADJUSTED PRESSURE	0.1	0.08	0.08	0.09	0.08	0.07	0.1	0.07	0.07	0.1	0.11	0.18	0.1	0.09	0.1	0.1	0.12	0.09	0.09	0.12	0.09	0.13	0.09	0.1
ROUND DUCT SIZE	5	4	4	5	6	6	4	4	4	5	4	5	5	5	5	5	4	4	6	4	5	5	5	5
HEATING VELOCITY (ft/min)	286	356	356	264	250	240	138	149	264	286	333	264	396	448	448	191	115	103	581	654	609	609	609	609
COOLING VELOCITY (ft/min)	573	356	356	470	500	459	69	161	172	573	447	411	499	624	624	404	402	34	173	195	154	154	154	154
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10
TRUNK	C	A	A	D	C	B	E	A	C	E	C	D	B	A	A	A	C	B	B	E	A	E	B	B

RUN #	25	26	27	28	29	30	31	32
ROOM NAME	BED-3	BED-4	KT/GT	LIV	HIS	BAS	BED-5	BAS
RM LOSS MBH	2.24	2.14	2.79	2.49	0.52	3.81	1.30	3.81
CFM PER RUN HEAT	49	47	61	54	11	83	28	83
RM GAIN MBH	3.04	2.79	2.63	2.12	0.17	0.66	2.09	0.66
CFM PER RUN COOLING	98	90	85	68	5	21	67	21
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.17	0.16	0.17	0.16
ACTUAL DUCT LGH	49	66	41	31	73	12	60	37
EQUIVALENT LENGTH	170	130	90	130	180	120	180	160
TOTAL EFFECTIVE LENGTH	219	196	131	161	253	132	240	197
ADJUSTED PRESSURE	0.07	0.08	0.12	0.11	0.07	0.12	0.07	0.08
ROUND DUCT SIZE	6	6	5	5	4	5	5	6
HEATING VELOCITY (ft/min)	250	240	448	396	126	609	206	423
COOLING VELOCITY (ft/min)	500	459	624	499	57	154	492	107
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10
TRUNK	C	B	C	B	A	D	A	B

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	345	0.07	9.7	12	x 8 518
TRUNK B	574	0.07	11.8	16	x 8 646
TRUNK C	1179	0.07	15.4	28	x 8 758
TRUNK D	155	0.09	6.8	8	x 8 349
TRUNK E	1370	0.07	16.3	30	x 8 822
TRUNK F	0	0.00	0	0	x 8 0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.06	0	0	x 8 0
TRUNK P	0	0.06	0	0	x 8 0
TRUNK Q	0	0.06	0	0	x 8 0
TRUNK R	0	0.06	0	0	x 8 0
TRUNK S	0	0.06	0	0	x 8 0
TRUNK T	0	0.06	0	0	x 8 0
TRUNK U	0	0.06	0	0	x 8 0
TRUNK V	0	0.06	0	0	x 8 0
TRUNK W	0	0.06	0	0	x 8 0

RETURN AIR #

	1	2	3	4	5	6	7	8	9	10	BR
AIR VOLUME	145	120	120	120	155	155	155	155	120	50	230
PLENUM PRESSURE	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	48	46	47	56	47	32	23	33	48	65	14
EQUIVALENT LENGTH	165	185	205	145	200	195	205	195	190	195	145
TOTAL EFFECTIVE LH	213	231	252	201	247	227	228	228	238	260	159
ADJUSTED PRESSURE	0.07	0.06	0.06	0.07	0.06	0.07	0.06	0.06	0.06	0.06	0.09
ROUND DUCT SIZE	7	6.8	6.8	6.6	7.5	7.2	7.5	7.5	6.8	4.9	7.9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8	8
	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	14	14	14	14	24

TRUNK X	1525	0.06	17.7	32	x 10 686
TRUNK Y	465	0.06	11.3	14	x 8 598
TRUNK Z	900	0.06	14.5	24	x 8 675
DROP	1525	0.06	17.7	24	x 14 654

TYPE: 4203- THE FORESTCREST
SITE NAME: PINE VALLEY & TESTON

LO # 77468
OPT. 5 BED

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	<u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm <u>63.6</u> cfm	
Other Rooms	<u>6</u> @ 10.6 cfm <u>63.6</u> cfm	
Table 9.32.3.A.	TOTAL <u>212.0</u> cfm	

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8 cfm	
2 Bedroom	47.7 cfm	
3 Bedroom	63.6 cfm	
4 Bedroom	79.5 cfm	
5 Bedroom	95.4 cfm	
TOTAL	95.4 cfm	

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>212</u> cfm	
Less Principal Ventil. Capacity	<u>155</u> cfm	
Required Supplemental Capacity	<u>57.0</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY			
Model:	VANEE 65H		
Location:	BSMT		
<u>155.0</u> cfm	<u>3.0</u> sones ☒ HVI Approved		
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
155.0 CFM	X 76 F	X 1.08	X 0.25

SUPPLEMENTAL FANS		NUTONE		
Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	☒	0.3
ENS-5	QTXEN050C	50	☒	0.3
ENS-4	QTXEN050C	50	☒	0.3
PWD	QTXEN050C	50	☒	0.3

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model:	VANEE 65H	
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER:	
GOLD PARK HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

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

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	February-20

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 77468	Model: 4203- THE FORESTCREST	Builder: GOLD PARK HOMES	Date: 2/24/2020																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <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>1728</td> <td>10</td> <td>17280</td> </tr> <tr> <td>First</td> <td>1728</td> <td>11</td> <td>19008</td> </tr> <tr> <td>Second</td> <td>2103</td> <td>9</td> <td>18927</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>55,215.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1563.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1728	10	17280	First	1728	11	19008	Second	2103	9	18927	Third	0	9	0	Fourth	0	9	0	Total:			55,215.0 ft³	Total:			1563.5 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%; text-align: center;">0.340</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.124</td> </tr> </table> <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 style="text-align: center;">22</td> <td style="text-align: center;">-20</td> <td style="text-align: center;">42</td> <td style="text-align: center;">76</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">22</td> <td style="text-align: center;">31</td> <td style="text-align: center;">9</td> <td style="text-align: center;">16</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.340	SUMMER NATURAL AIR CHANGE RATE	0.124	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-20	42	76	Summer DTDc	22	31	9	16
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.340 x 434.31 x 42 °C x 1.2 = 7483 W = 25532 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.124 x 434.31 x 9 °C x 1.2 = 567 W = 1936 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 16 °F x 1.08 x 0.25 = 661 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	25,532	10,090	1.265																																																								
2	0.3		16,802	0.456																																																								
3	0.2		16,893	0.302																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4203- THE FORESTCREST	OPT. 5 BED	BUILDER: GOLD PARK HOMES
SFQT: 3688	LO# 77468	SITE: PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
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 (ft ³):	55215.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 66.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	198.0 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	-

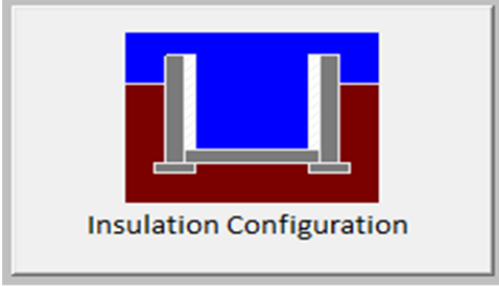
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	20.1	 Insulation Configuration
Floor Width (m):	10.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	4.0	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1951

TYPE: 4203- THE FORESTCREST
LO# 77468

OPT. 5 BED

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Vaughan (Woodbridge)			
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):	1563.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2084.2 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	73.2	73.2		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.340			
Cooling Air Leakage Rate (ACH/H):	0.124			

TYPE: 4203- THE FORESTCREST
LO# 77468

OPT. 5 BED

CSA-F280-12

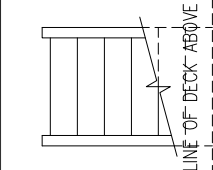
PACKAGE A1

WOD

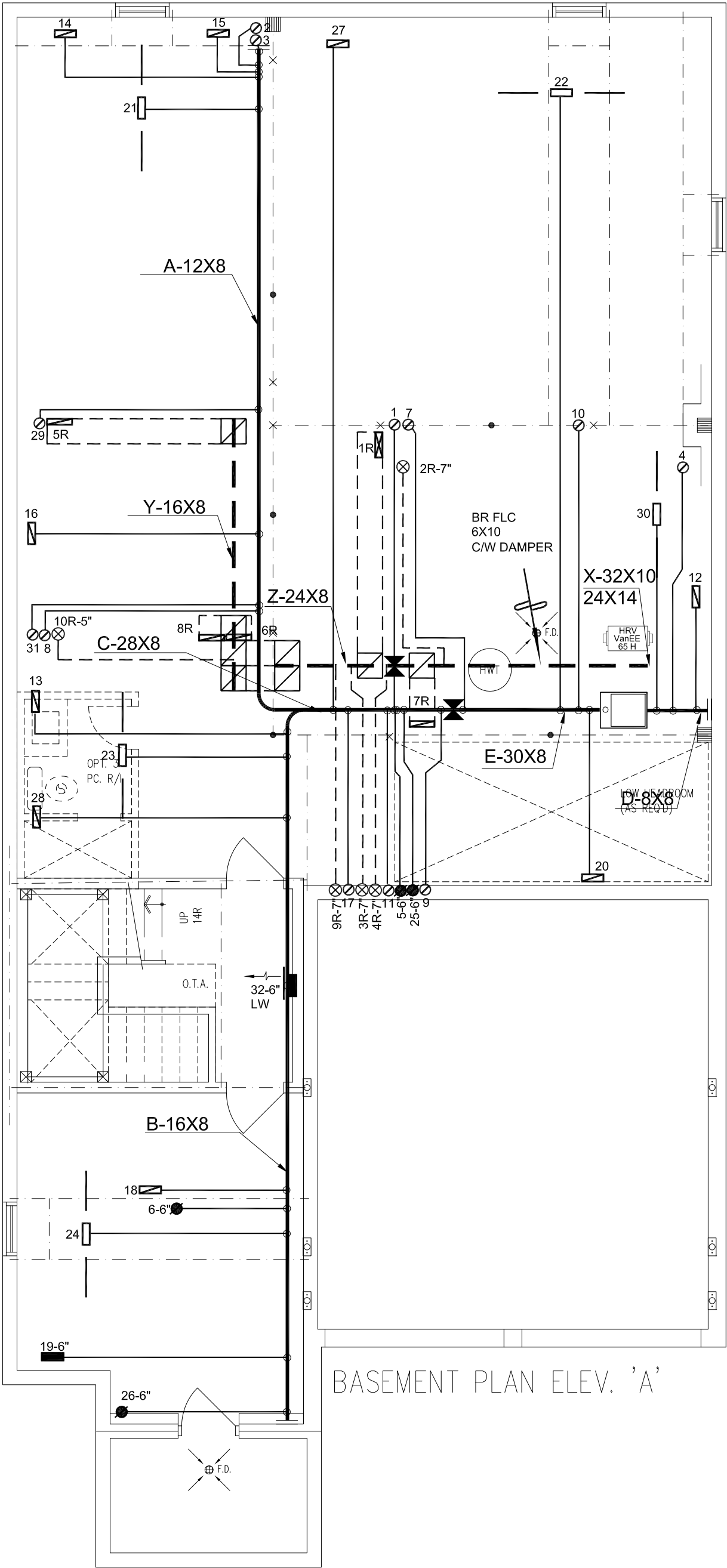
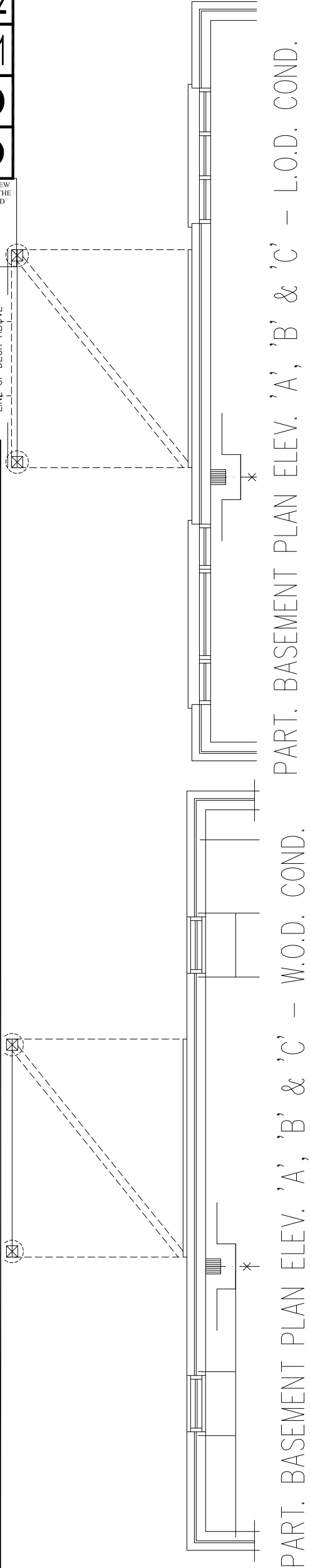
LOD

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			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR
	6" SUPPLY AIR STACK 2nd FLOOR		FRA-FLOOR RETURN AIR GRILLE
	14"x8" RETURN AIR GRILLE		30"x8" RETURN AIR GRILLE
	RETURN AIR STACK ABOVE		RETURN AIR STACK 2nd FLOOR
	REDUCER		
REVISIONS			
4.	REVISED AS PER ARCHITECTURALS	4.	REVISED AS PER CAD
3.	ADDED RETURN #10 TO BED-5	2.	DECK CONDITIONS ADDED
		1.	REVISED AS PER CAD
			JUL Y/2018



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Client	GOLD PARK HOMES
Project Name	PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT. 5 BED THE FORESTCREST 4203 3688 sqft

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.

HEAT LOSS 73168 BTU/H UNIT DATA		# OF RUNS	S/A	R/A	FANS
MAKE	LENNOX	3RD FLOOR			
MODEL	EL296UH090XE48C	2ND FLOOR	16	6	6
INPUT	88 MBTU/H	1ST FLOOR	10	4	2
OUTPUT	85 MBTU/H	BASEMENT	6	1	0
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			
FAN SPEED	1525 cfm @ 0.6" w.c.				

Sheet Title	BASEMENT HEATING LAYOUT
Date	JAN/2018
Scale	3/16" = 1'-0"
	BCIN# 19669
LO#	77468

CSA-F280-12

PACKAGE A1

WOD

LOD

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.

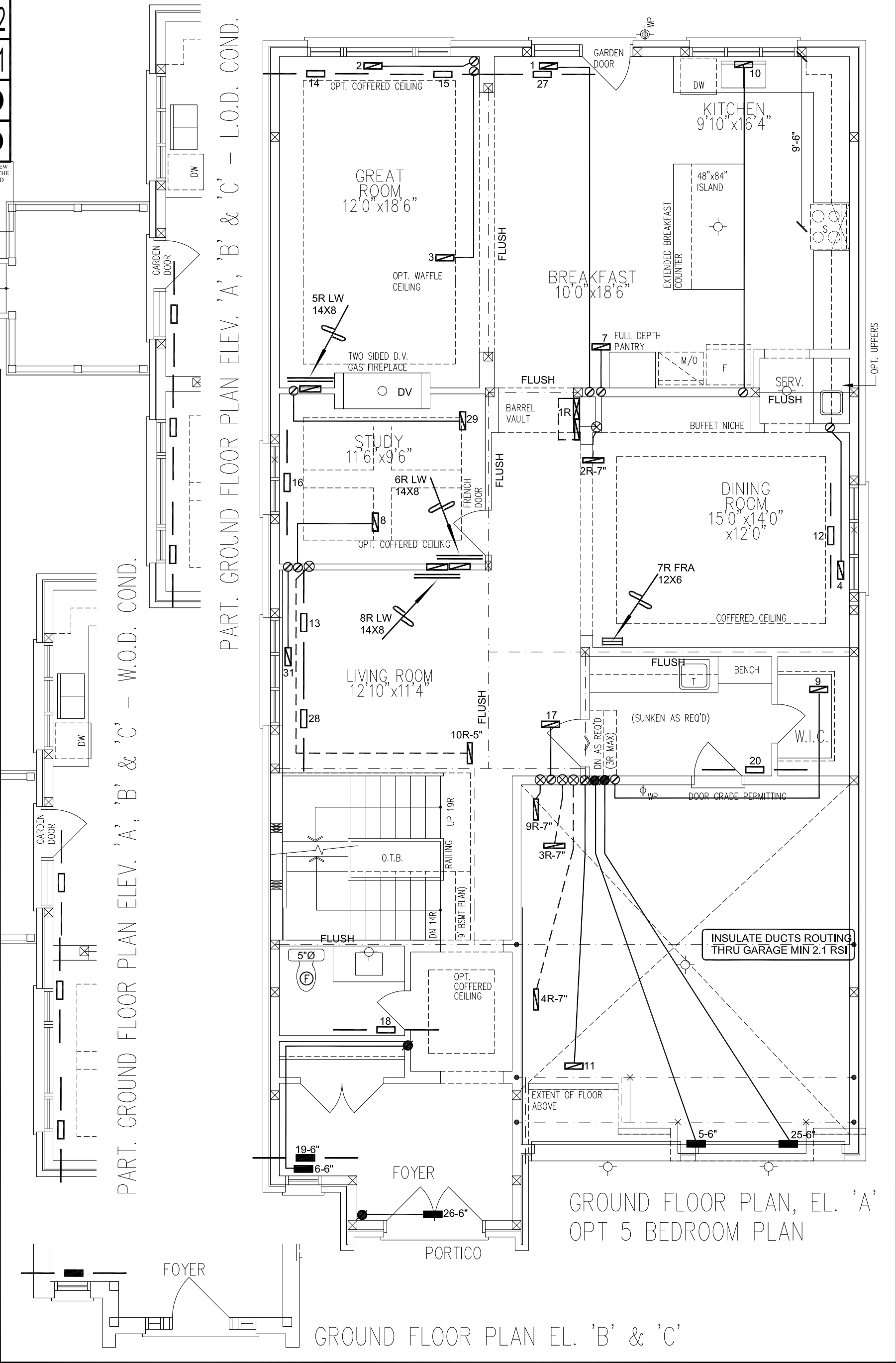
Michael O'Rourke

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

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE		SUPPLY AIR STACK 2ND FLOOR		FRA- FLOOR RETURN AIR GRILLE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2ND FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE		RETURN AIR STACK 2ND FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2ND FLOOR		FRA- FLOOR RETURN AIR GRILLE		RETURN AIR STACK ABOVE		RETURN AIR STACK 2ND FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE		RETURN AIR STACK 2ND FLOOR
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SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
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	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE
	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE
	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE
	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE
	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE
	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE
	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE
	SUPPLY AIR GRILLE		SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE

REVISIONS	DESCRIPTION	DATE
1.	REVISED AS PER CAD	JUL Y/2018
2.	DECK CONDITIONS ADDED	SEPT/2018
3.	ADDED RETURN #10 TO BED-5	NOV/2018
4.	REVISED AS PER ARCHITECTURALS	FEB/2020

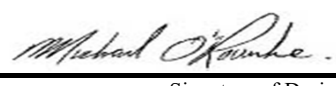


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Client	GOLD PARK HOMES Project Name PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT. 5 BED THE FORESTCREST 4203 3688 sqft	375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdsgns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title FIRST FLOOR HEATING LAYOUT Date JAN/2018 Scale 3/16" = 1'-0" BCIN# 19669 LO# 77468
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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 VAUGHAN (WOODBIDGE)	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@hvacdesigns.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: 4203- THE FORESTCREST OPT. 5 BED - WOB Project: PINE VALLEY & TESTON	
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.			
February 25, 2020		 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: PINE VALLEY & TESTON										OPT. 5 BED - WOB										DATE: Feb-20										WINTER NATURAL AIR CHANGE RATE 0.407										HEAT LOSS ΔT °F. 76										CSA-F280-12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
BUILDER: GOLD PARK HOMES										TYPE: 4203- THE FORESTCREST										GFA: 3688										LO# 79977										SUMMER NATURAL AIR CHANGE RATE 0.137										HEAT GAIN ΔT °F. 13										SB-12 PACKAGE A1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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GRS.WALL AREA										342					333					63					144					297					432					54					108					81					72					54																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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NORTH										21.3	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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

ROOM USE				DIN		LIV		KT/GT		STUDY		LAUN		PWD		FOY		MUD						WOB		BAS	
EXP. WALL				12		21		75		10		0		6		51		26						43		155	
CLG. HT.				11		20		11		11		9		11		11		12						10		10	
GRS.WALL AREA		FACTORS																									
LOSS		GAIN																									
GLAZING				132		420		825		110		0		66		561		312						430		1085	
LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN	
NORTH	21.3	16.0	32	681	511	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	85	64
EAST	21.3	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.9	0	0	0	74	1575	1843	0	0	0	20	426	498	0	0	0	0	0	0	0	0	0	4	85	100	
WEST	21.3	41.6	0	0	0	0	0	0	98	2085	4072	0	0	0	0	0	0	0	0	0	0	0	91	1936	3781	0	0
SKYLT.	37.2	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	20	505	85	0	0	0	0	0	52	1313	221	20	505	85	20	505	85	20	505
NET EXPOSED WALL	4.5	0.8	100	446	75	346	1544	260	707	3155	531	90	402	68	0	0	66	295	50	509	2272	383	292	1303	219	319	1424
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	231	296	136	0	0	0	0	0	0	130	167	76	0	0	0	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	60	153	26	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS																											
SLAB ON GRADE HEAT LOSS																											
SUBTOTAL HT LOSS						1127		3415		5746		827		320		295		3584		1808				552		4417	
SUB TOTAL HT GAIN							586		2238		4689		566		102		50		604		305			4106		4858	
LEVEL FACTOR / MULTIPLIER			0.30	0.55		0.30	0.55		0.30	0.55		0.30	0.55		0.20	0.36		0.30	0.55		0.30	0.55			0.50	1.65	530
AIR CHANGE HEAT LOSS						615		1863		3134		451		116		161		1955		986						15274	
AIR CHANGE HEAT GAIN							51		196		411		50		9		4		53		27					406	
DUCT LOSS						0		0		0		0		44		0		0		0						0	
DUCT GAIN						0		0		0		0		75		0		0		0		0				0	
HEAT GAIN PEOPLE	240		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS						642		642		642		642		642		642		0		0		0		0		642	
TOTAL HT LOSS BTU/H						1742		5278		8879		1278		479		455		5540		2794				4968		20132	
TOTAL HT GAIN x 1.3 BTU/H						1663		3999		7463		1634		1077		70		854		431				5338		2052	

SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

OPT. 5 BED - WOB
TYPE: 4203- THE FORESTCREST

DATE: Feb-20

GFA: 3688

LO# 79977

HEATING CFM 1525 COOLING CFM 1525
TOTAL HEAT LOSS 74,771 TOTAL HEAT GAIN 48,323
AIR FLOW RATE CFM 20.4 AIR FLOW RATE CFM 31.56

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

^LENNOX
EL296UH090XE48C

AFUE = 96 %
INPUT (BTU/H) = 88,000
OUTPUT (BTU/H) = 85,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	10	6
R/A	0	0	6	4	1

plenium pressure s/a 0.18
max s/a dif press. loss 0.03
min adjusted pressure s/a 0.15

r/a pressure 0.17
r/a grille press. Loss 0.02
adjusted pressure r/a 0.15

FAN SPEED 90
LOW 0
MEDLOW 0
MEDIUM 1105
MEDIUM HIGH 1255
HIGH 1525

DESIGN CFM = 1525
CFM @ .6" E.S.P.

TEMPERATURE RISE 52 °F

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	HERS	ENS-5	ENS-3	MBR	ENS-4	DIN	LIV	KT/GT	KT/GT	STUDY	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.85	1.50	1.50	1.73	2.35	2.23	0.56	0.64	1.13	1.85	1.41	1.74	2.64	2.96	2.96	1.28	0.48	0.46	5.54	2.79	4.18	4.18	4.18	4.18
CFM PER RUN HEAT	38	31	31	35	48	46	11	13	23	38	29	36	54	60	60	26	10	9	113	57	85	85	85	85
RM GAIN MBH	2.33	0.90	0.90	1.90	2.90	2.67	0.17	0.39	0.41	2.33	1.13	1.66	2.00	2.49	2.49	1.63	1.08	0.07	0.85	0.43	1.23	1.23	1.23	1.23
CFM PER RUN COOLING	73	28	28	60	92	84	5	12	13	73	36	52	63	79	79	52	34	2	27	14	39	39	39	39
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	46	62	72	29	47	64	35	53	42	41	42	8	28	57	49	35	32	43	55	8	63	43	24	46
EQUIVALENT LENGTH	130	160	140	160	150	170	140	180	190	130	120	90	150	130	120	140	110	140	120	130	180	130	150	110
TOTAL EFFECTIVE LENGTH	176	222	212	189	197	234	175	233	232	171	162	98	178	187	169	175	142	183	175	138	243	173	174	156
ADJUSTED PRESSURE	0.1	0.08	0.08	0.09	0.08	0.07	0.1	0.07	0.07	0.1	0.11	0.18	0.1	0.09	0.1	0.1	0.12	0.09	0.09	0.12	0.07	0.09	0.09	0.1
ROUND DUCT SIZE	5	4	4	5	6	6	4	4	4	5	4	5	5	5	5	5	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	279	356	356	257	245	235	126	149	264	279	333	264	396	441	441	191	115	103	576	654	433	433	433	433
COOLING VELOCITY (ft/min)	536	321	321	441	469	428	57	138	149	536	413	382	463	580	580	382	390	23	138	161	199	199	199	199
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	A	A	D	C	B	E	A	E	E	C	D	B	A	A	A	C	B	B	E	A	D	B	B

RUN #	25	26	27	28	29	30	31	32
ROOM NAME	BED-3	BED-4	KT/GT	LIV	HIS	BAS	BED-5	BAS
RM LOSS MBH	2.35	2.23	2.96	2.64	0.54	4.18	1.36	4.18
CFM PER RUN HEAT	48	46	60	54	11	85	28	85
RM GAIN MBH	2.90	2.67	2.49	2.00	0.14	1.23	2.02	1.23
CFM PER RUN COOLING	92	84	79	63	4	39	64	39
ADJUSTED PRESSURE	0.16	0.16	0.17	0.17	0.17	0.16	0.17	0.16
ACTUAL DUCT LGH	49	66	41	31	73	12	60	37
EQUIVALENT LENGTH	170	130	90	130	180	120	180	160
TOTAL EFFECTIVE LENGTH	219	196	131	161	253	132	240	197
ADJUSTED PRESSURE	0.07	0.08	0.13	0.11	0.07	0.12	0.07	0.08
ROUND DUCT SIZE	6	6	5	5	4	6	5	6
HEATING VELOCITY (ft/min)	245	235	441	396	126	433	206	433
COOLING VELOCITY (ft/min)	469	428	580	463	46	199	470	199
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10
TRUNK	C	B	C	B	A	D	A	B

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	345	0.07	9.7	12	x 8 518
TRUNK B	577	0.07	11.8	16	x 8 649
TRUNK C	1155	0.07	15.3	28	x 8 743
TRUNK D	241	0.09	8	8	x 8 542
TRUNK E	1284	0.07	15.9	32	x 8 722
TRUNK F	0	0.00	0	0	x 8 0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.06	0	0	x 8 0
TRUNK P	0	0.06	0	0	x 8 0
TRUNK Q	0	0.06	0	0	x 8 0
TRUNK R	0	0.06	0	0	x 8 0
TRUNK S	0	0.06	0	0	x 8 0
TRUNK T	0	0.06	0	0	x 8 0
TRUNK U	0	0.06	0	0	x 8 0
TRUNK V	0	0.06	0	0	x 8 0
TRUNK W	0	0.06	0	0	x 8 0

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	BR
AIR VOLUME	145	120	120	120	155	155	155	155	120	50	230
PLENUM PRESSURE	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	48	46	47	56	47	32	23	33	48	65	14
EQUIVALENT LENGTH	165	185	205	145	200	195	205	195	190	195	145
TOTAL EFFECTIVE LH	213	231	252	201	247	227	228	228	238	260	159
ADJUSTED PRESSURE	0.07	0.06	0.06	0.07	0.06	0.07	0.06	0.06	0.06	0.06	0.09
ROUND DUCT SIZE	7	6.8	6.8	6.6	7.5	7.2	7.5	7.5	6.8	4.9	7.9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8	8
	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	14	14	14	14	24

TRUNK X	1525	0.06	17.7	32	x 10 686
TRUNK Y	465	0.06	11.3	14	x 8 598
TRUNK Z	850	0.06	14.2	24	x 8 638
DROP	1525	0.06	17.7	24	x 14 654

TYPE: 4203- THE FORESTCREST
SITE NAME: PINE VALLEY & TESTON

LO # 79977
OPT. 5 BED - WOB

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	<u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Kitchen & Bathrooms	<u>7</u> @ 10.6 cfm <u>74.2</u> cfm	
Other Rooms	<u>6</u> @ 10.6 cfm <u>63.6</u> cfm	
Table 9.32.3.A.	TOTAL <u>222.6</u> cfm	

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8 cfm	
2 Bedroom	47.7 cfm	
3 Bedroom	63.6 cfm	
4 Bedroom	79.5 cfm	
5 Bedroom	95.4 cfm	
TOTAL	95.4 cfm	

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>222.6</u> cfm	
Less Principal Ventil. Capacity	<u>155</u> cfm	
Required Supplemental Capacity	<u>67.6</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY			
Model: VANEE 65H	Location: BSMT		
<u>155.0</u> cfm	<u>3.0</u> sones ☒ HVI Approved		
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
155.0 CFM	X 76 F	X 1.08	X 0.25

SUPPLEMENTAL FANS		NUTONE	
Location	Model	cfm	HVI
ENS	QTXEN050C	50	☒
ENS-5	QTXEN050C	50	☒
ENS-4	QTXEN050C	50	☒
PWD	QTXEN050C	50	☒

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER:	
GOLD PARK HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

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

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	February-20

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 79977	Model: 4203- THE FORESTCREST	Builder: GOLD PARK HOMES	Date: 2/25/2020																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <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>1728</td> <td>10</td> <td>17280</td> </tr> <tr> <td>First</td> <td>1728</td> <td>11</td> <td>19008</td> </tr> <tr> <td>Second</td> <td>2103</td> <td>9</td> <td>18927</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>55,215.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1563.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1728	10	17280	First	1728	11	19008	Second	2103	9	18927	Third	0	9	0	Fourth	0	9	0	Total:			55,215.0 ft³	Total:			1563.5 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%; text-align: center;">0.407</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.137</td> </tr> </table> <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 style="text-align: center;">22</td> <td style="text-align: center;">-20</td> <td style="text-align: center;">42</td> <td style="text-align: center;">76</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.407	SUMMER NATURAL AIR CHANGE RATE	0.137	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-20	42	76	Summer DTDc	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.407 x 434.31 x 42 °C x 1.2 = 8953 W = 30549 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.137 x 434.31 x 7 °C x 1.2 = 506 W = 1726 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 13 °F x 1.08 x 0.25 = 536 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	30,549	9,274	1.647																																																								
2	0.3		16,802	0.545																																																								
3	0.2		16,893	0.362																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4203- THE FORESTCREST	OPT. 5 BED - WOB	BUILDER: GOLD PARK HOMES
SFQT: 3688	LO# 79977	SITE: PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
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:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	55215.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 66.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	155.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	43.0 ft

2012 OBC - COMPLIANCE PACKAGE

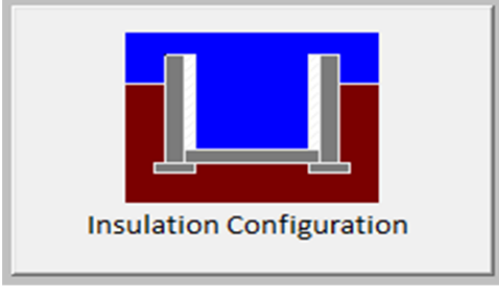
Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 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

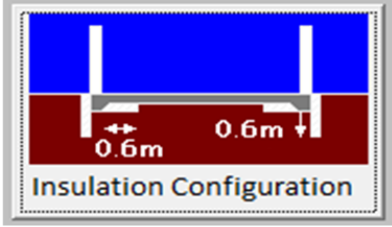
Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	 Insulation Configuration
Floor Width (m):	10.1	
Exposed Perimeter (m):	47.2	
Wall Height (m):	3.0	
Depth Below Grade (m):	1.79	
Window Area (m ²):	0.7	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		735

TYPE: 4203- THE FORESTCREST
LO# 79977

OPT. 5 BED - WOB

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	1.5	
Width (m):	10.1	
Exposed Perimeter (m):	13.1	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		162

TYPE: 4203- THE FORESTCREST
LO# 79977

OPT. 5 BED - WOB

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Vaughan (Woodbridge)			
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):	9.14			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1563.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2084.2 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	73.2	73.2		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.407			
Cooling Air Leakage Rate (ACH/H):	0.137			

TYPE: 4203- THE FORESTCREST
LO# 79977

OPT. 5 BED - WOB

CSA-F280-12

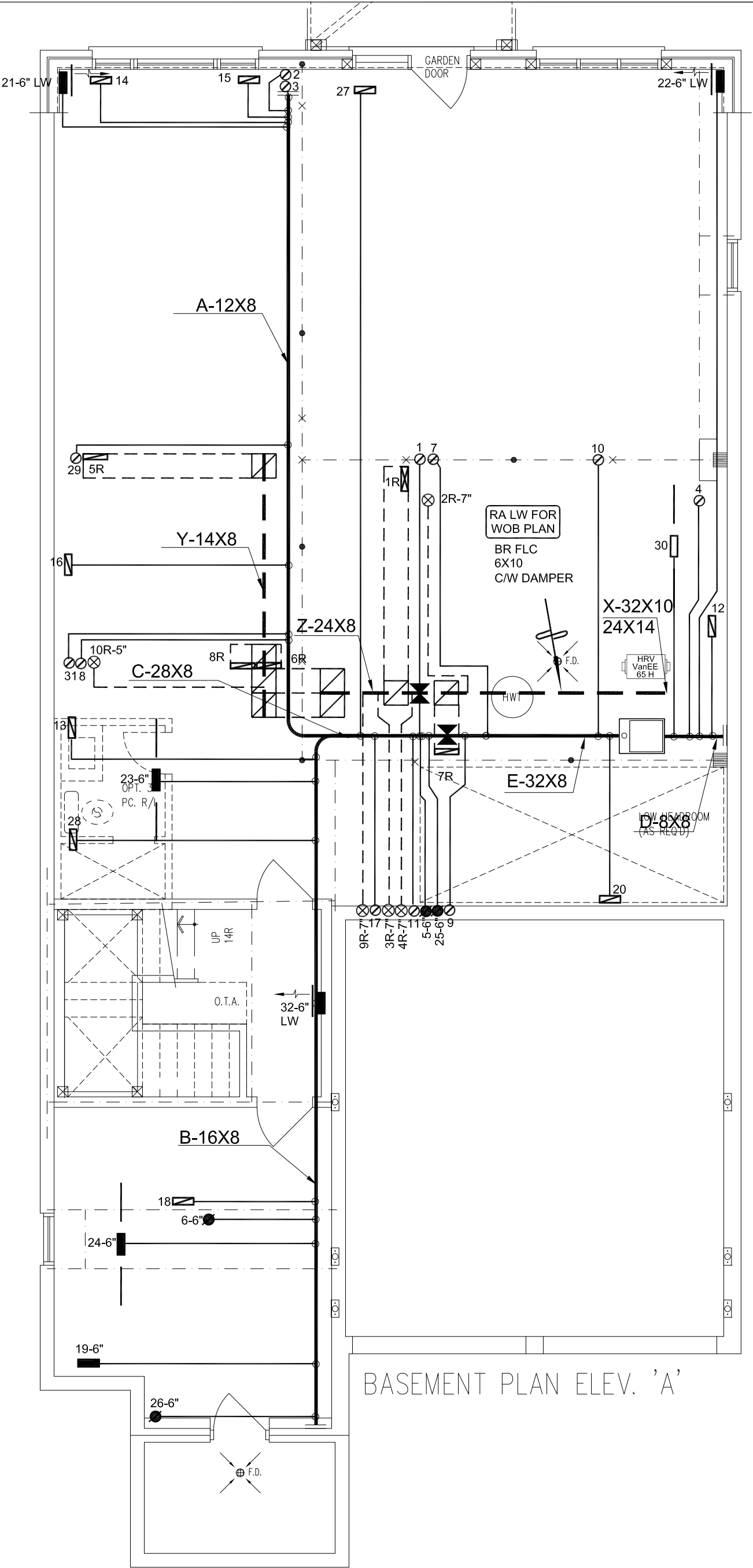
PACKAGE A1

WOB

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

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

HVAC LEGEND			REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	No.	Description
	SUPPLY AIR GRILLE		1.	ADDED RETURN #10 TO BED-5
	SUPPLY AIR GRILLE 6" BOOT			
	SUPPLY AIR BOOT ABOVE			
	6" SUPPLY AIR STACK 2nd FLOOR			
	14"x8" RETURN AIR GRILLE			
	30"x8" RETURN AIR GRILLE			
	REDUCER			



BASEMENT PLAN ELEV. 'A'

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Client	GOLD PARK HOMES
Project Name	PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT. 5 BED THE FORESTCREST - WOB 4203 3688 sqft

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.

HEAT LOSS 77951 BTU/H UNIT DATA		# OF RUNS	S/A	R/A	FANS
MAKE	LENNOX	3RD FLOOR			
MODEL	EL296UH090XE48C	2ND FLOOR	16	6	6
INPUT	88 MBTU/H	1ST FLOOR	10	4	2
OUTPUT	85 MBTU/H	BASEMENT	6	1	0
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			
FAN SPEED	1525 cfm @ 0.6" w.c.				

Sheet Title	BASEMENT HEATING LAYOUT
Date	SEPT/2018
Scale	3/16" = 1'-0"
BCIN#	19669
LO#	79977

CSA-F280-12

PACKAGE A1

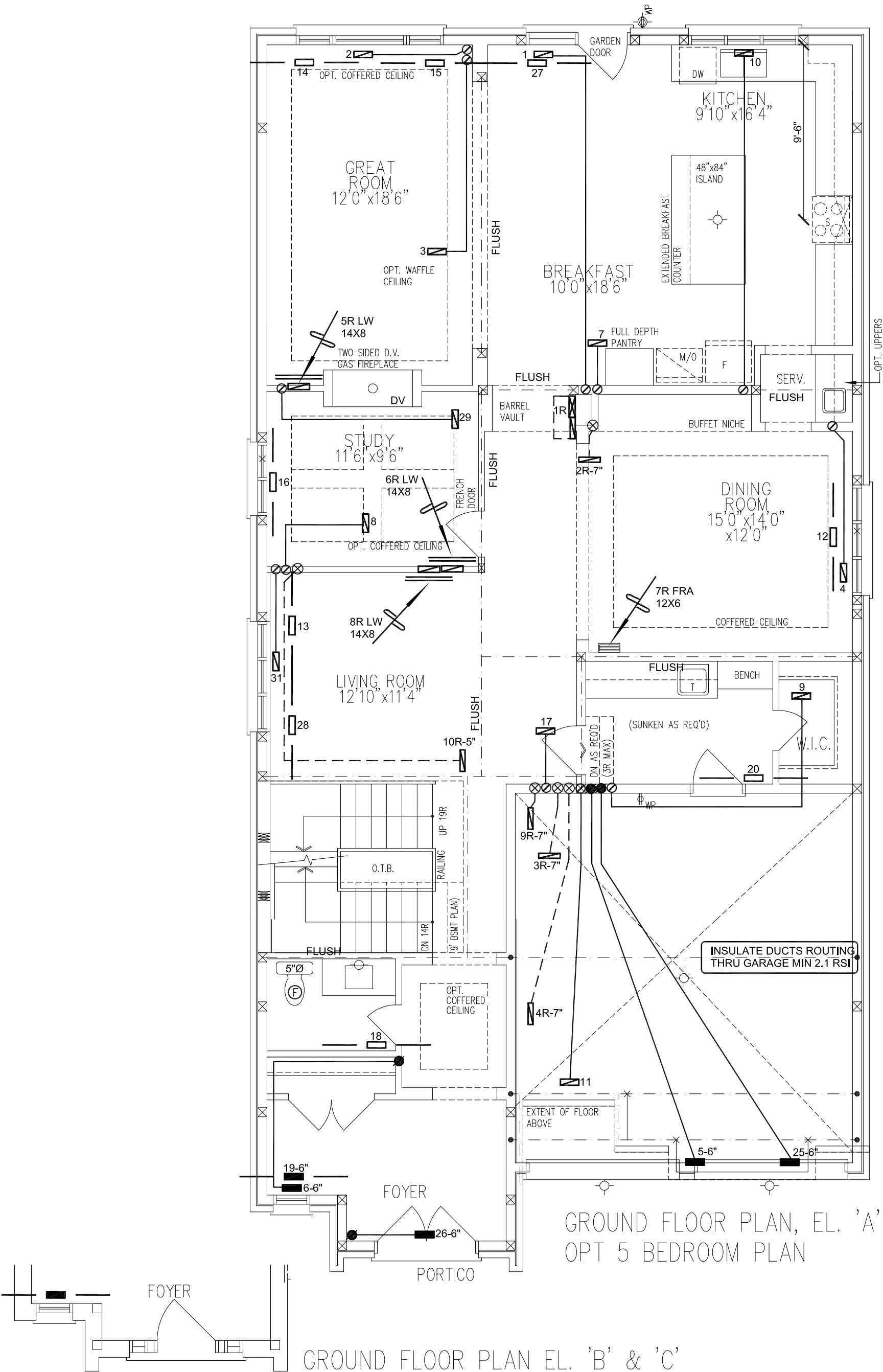
WOB

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		
SYMBOL	DESCRIPTION	SYMBOL
	SUPPLY AIR GRILLE	
	SUPPLY AIR BOOT ABOVE	
	SUPPLY AIR STACK FROM 2nd FLOOR	
	SUPPLY AIR STACK 2nd FLOOR	
	FRA- FLOOR RETURN AIR GRILLE	
	RETURN AIR STACK ABOVE	
	REDUCER	
REVISIONS		
No.	Description	Date
1.	ADDED RETURN #10 TO BED-5	NOV/2018
2.	REVISED AS PER ARCHITECTURALS	FEB/2020
3.		



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Client

GOLD PARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED
THE FORESTCREST - WOB
4203 3688 sqft

HVACDESIGNS LTD.

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca

Specializing in Residential Mechanical Design Services

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

Sheet Title

FIRST FLOOR
HEATING
LAYOUT

Date

SEPT/2018

Scale

3/16" = 1'-0"

BCIN# 19669

LO# 79977

CSA-F280-12

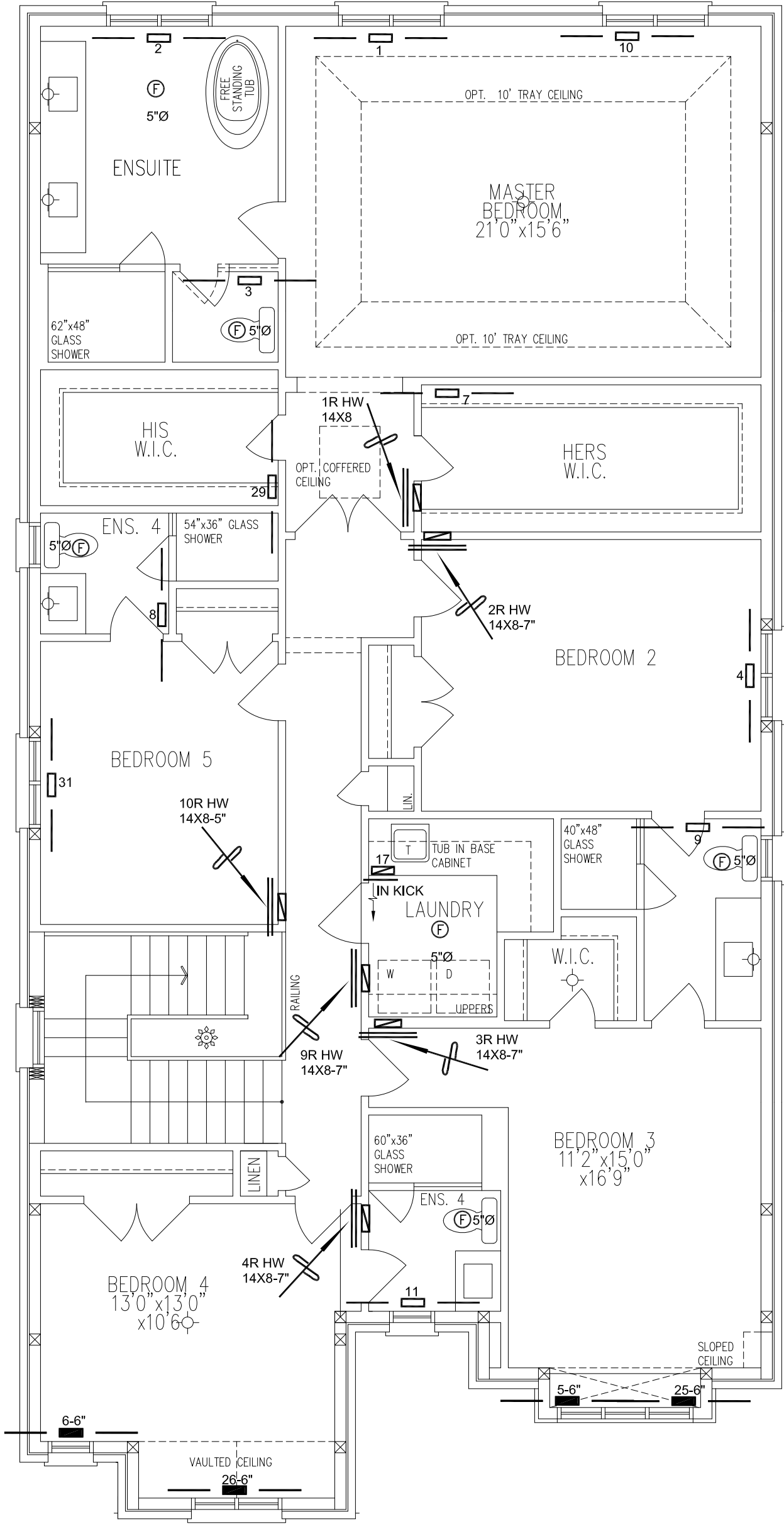
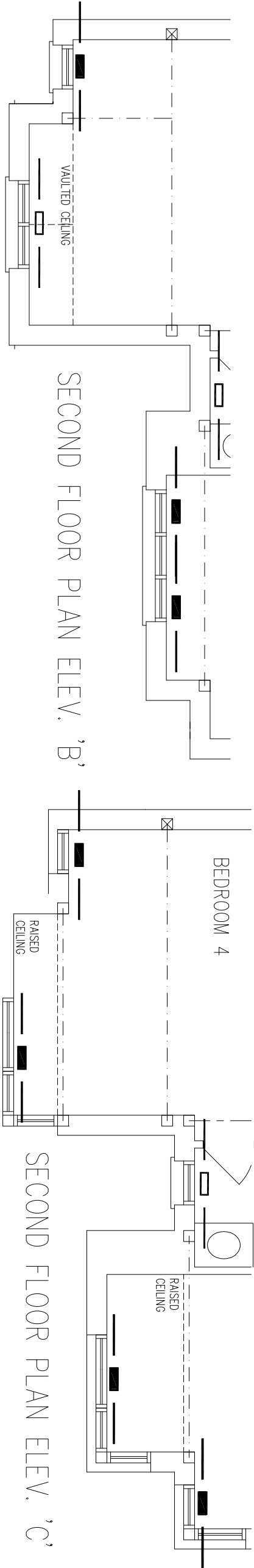
PACKAGE A1

WOB

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				
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE	1.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR	2.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR	3.
	6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	
	RETURN AIR STACK ABOVE		RETURN AIR STACK 2nd FLOOR	
	REDUCER			
REVISIONS				
			No.	Date
			1.	NOV/2018
			2.	FEB/2020
			3.	
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ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client	GOLD PARK HOMES
Project Name	PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT. 5 BED THE FORESTCREST - WOB 4203 3688 sqft

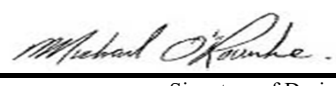
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

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	SECOND FLOOR HEATING LAYOUT
Date	SEPT/2018
Scale	3/16" = 1'-0"
BCIN#	19669
LO#	79977

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 VAUGHAN (WOODBIDGE)	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@hvacdesigns.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: 4203- THE FORESTCREST OPT ENS Project: PINE VALLEY & TESTON	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name)		declare that (choose one as appropriate):	
☐ 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.			
February 28, 2020		 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: PINE VALLEY & TESTON										OPT ENS										DATE: Feb-20										WINTER NATURAL AIR CHANGE RATE 0.340										HEAT LOSS ΔT °F. 76										CSA-F280-12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
BUILDER: GOLD PARK HOMES										TYPE: 4203- THE FORESTCREST										GFA: 3688										LO# 85477										SUMMER NATURAL AIR CHANGE RATE 0.124										HEAT GAIN ΔT °F. 16										SB-12 PACKAGE A1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

OPT ENS
TYPE: 4203- THE FORESTCREST

DATE: Feb-20

GFA: 3688 LO# 85477

HEATING CFM 1525 COOLING CFM 1525
TOTAL HEAT LOSS 69,424 TOTAL HEAT GAIN 47,327
AIR FLOW RATE CFM 21.97 AIR FLOW RATE CFM 32.22

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

*LENNOX
EL296UH090XE48C
FAN SPEED 90

AFUE = 96 %
INPUT (BTU/H) = 88,000
OUTPUT (BTU/H) = 85,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	4	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.03 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.15 adjusted pressure r/a 0.15

MEDLOW 0
MEDIUM 1105
MEDIUM HIGH 1255
HIGH 1525

DESIGN CFM = 1525
CFM @ 6" E.S.P.

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	ENS-2	WIC	ENS-3	MBR	ENS-4	DIN	LIV	KT/GT	KT/GT	STUDY	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.79	1.44	1.44	1.67	2.26	2.25	0.70	1.34	1.09	1.79	1.36	1.64	2.49	2.79	2.79	1.20	0.46	0.43	5.22	2.63	4.57	4.57	4.57	4.57
CFM PER RUN HEAT	39	32	32	37	50	50	15	30	24	39	30	36	55	61	61	26	10	9	115	58	100	100	100	100
RM GAIN MBH	2.46	0.98	0.98	2.03	3.07	2.88	0.36	0.94	0.46	2.46	1.21	1.79	2.15	2.65	2.65	1.75	1.16	0.09	1.07	1.43	0.80	0.80	0.80	0.80
CFM PER RUN COOLING	79	31	31	66	99	93	12	30	15	79	39	58	69	85	85	56	37	3	35	46	26	26	26	26
ADJUSTED PRESSURE	0.17	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	0.16	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	46	62	59	29	47	64	21	53	42	41	42	8	28	57	49	35	32	43	55	8	48	33	24	46
EQUIVALENT LENGTH	130	160	190	160	150	170	140	180	190	130	120	90	150	130	120	140	110	140	120	130	130	90	150	110
TOTAL EFFECTIVE LENGTH	176	222	249	189	197	234	161	233	232	171	162	98	178	187	169	175	142	183	175	138	178	123	174	156
ADJUSTED PRESSURE	0.1	0.08	0.07	0.09	0.08	0.07	0.11	0.07	0.07	0.1	0.11	0.18	0.1	0.09	0.1	0.1	0.12	0.09	0.09	0.12	0.09	0.13	0.09	0.1
ROUND DUCT SIZE	5	4	4	5	6	6	4	4	4	5	4	4	5	5	5	5	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	286	367	367	272	255	255	172	344	275	286	344	413	404	448	448	191	115	103	586	665	510	510	510	510
COOLING VELOCITY (ft/min)	580	356	356	485	505	474	138	344	172	580	447	665	507	624	624	411	424	34	178	528	133	133	133	133
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	A	A	D	C	B	D	A	C	E	C	D	B	A	A	A	C	B	B	E	A	E	B	B

RUN #	25	26	27	28	30
ROOM NAME	BED-3	BED-4	KT/GT	LIV	BAS
RM LOSS MBH	2.26	2.25	2.79	2.49	4.57
CFM PER RUN HEAT	50	50	61	55	100
RM GAIN MBH	3.07	2.88	2.65	2.15	0.80
CFM PER RUN COOLING	99	93	85	69	26
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.16
ACTUAL DUCT LGH	49	66	41	31	12
EQUIVALENT LENGTH	170	130	90	130	120
TOTAL EFFECTIVE LENGTH	219	196	131	161	132
ADJUSTED PRESSURE	0.07	0.08	0.12	0.11	0.12
ROUND DUCT SIZE	6	6	5	5	6
HEATING VELOCITY (ft/min)	255	255	448	404	510
COOLING VELOCITY (ft/min)	505	474	624	507	133
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10
TRUNK	C	B	C	B	D

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)
TRUNK A	342	0.07	9.7	12	x	8
TRUNK B	534	0.07	11.5	16	x	8
TRUNK C	1140	0.07	15	26	x	8
TRUNK D	188	0.09	7.3	8	x	8
TRUNK E	1337	0.07	16.2	30	x	8
TRUNK F	0	0.00	0	0	x	8

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)
TRUNK O	0	0.06	0	0	x	8
TRUNK P	0	0.06	0	0	x	8
TRUNK Q	0	0.06	0	0	x	8
TRUNK R	0	0.06	0	0	x	8
TRUNK S	0	0.06	0	0	x	8
TRUNK T	0	0.06	0	0	x	8
TRUNK U	0	0.06	0	0	x	8
TRUNK V	0	0.06	0	0	x	8
TRUNK W	0	0.06	0	0	x	8

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	175	125	125	130	155	175	155	155	125	0	0	0	0	0	0	0	205							
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							
ACTUAL DUCT LGH	48	46	47	56	47	32	23	33	48	1	1	1	1	1	1	1	14							
EQUIVALENT LENGTH	165	185	205	145	200	195	205	195	190	0	0	0	0	0	0	0	145							
TOTAL EFFECTIVE LH	213	231	252	201	247	227	228	228	238	1	1	1	1	1	1	1	159							
ADJUSTED PRESSURE	0.07	0.06	0.06	0.07	0.06	0.07	0.06	0.06	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09							
ROUND DUCT SIZE	7.5	6.9	6.9	6.8	7.5	7.5	7.5	7.5	6.9	0	0	0	0	0	0	0	7.5							
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8							
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
INLET GRILL SIZE	14	14	14	14	14	14	12	14	14	0	0	0	0	0	0	0	14							

TRUNK X	1525	0.06	17.7	32	x	10	686
TRUNK Y	485	0.06	11.5	16	x	8	546
TRUNK Z	915	0.06	14.6	24	x	8	686
DROP	1525	0.06	17.7	24	x	14	654

TYPE: 4203- THE FORESTCREST
SITE NAME: PINE VALLEY & TESTON

LO # 85477
OPT ENS

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	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>7</u> @ 10.6 cfm	<u>74.2</u> cfm
Table 9.32.3.A.	TOTAL	<u>212.0</u> cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		<u>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>212</u>	cfm
Less Principal Ventil. Capacity	<u>155</u>	cfm
Required Supplemental Capacity	<u>57.0</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model:	VANEE 65H		
Location:	BSMT		
<u>155.0</u> cfm	<u>3.0</u> sones		
☒ HVI Approved			
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
155.0 CFM	X 76 F	X 1.08	X 0.25

SUPPLEMENTAL FANS		NUTONE	
Location	Model	cfm	HVI
ENS	QTXEN050C	50	☒
ENS-2	QTXEN050C	50	☒
ENS-4	QTXEN050C	50	☒
PWD	QTXEN050C	50	☒

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model:	VANEE 65H	
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER:	
GOLD PARK HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

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

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	February-20

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 85477	Model: 4203- THE FORESTCREST	Builder: GOLD PARK HOMES	Date: 2/28/2020																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <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>1728</td> <td>10</td> <td>17280</td> </tr> <tr> <td>First</td> <td>1728</td> <td>11</td> <td>19008</td> </tr> <tr> <td>Second</td> <td>2103</td> <td>9</td> <td>18927</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>55,215.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1563.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1728	10	17280	First	1728	11	19008	Second	2103	9	18927	Third	0	9	0	Fourth	0	9	0	Total:			55,215.0 ft³	Total:			1563.5 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%; text-align: center;">0.340</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.124</td> </tr> </table> <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 style="text-align: center;">22</td> <td style="text-align: center;">-20</td> <td style="text-align: center;">42</td> <td style="text-align: center;">76</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">22</td> <td style="text-align: center;">31</td> <td style="text-align: center;">9</td> <td style="text-align: center;">16</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.340	SUMMER NATURAL AIR CHANGE RATE	0.124	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-20	42	76	Summer DTDc	22	31	9	16
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.340 x 434.31 x 42 °C x 1.2 = 7483 W = 25532 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.124 x 434.31 x 9 °C x 1.2 = 567 W = 1936 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 16 °F x 1.08 x 0.25 = 661 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	25,532	10,090	1.265																																																								
2	0.3		16,802	0.456																																																								
3	0.2		16,324	0.313																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4203- THE FORESTCREST	OPT ENS	BUILDER: GOLD PARK HOMES
SFQT: 3688	LO# 85477	SITE: PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
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 (ft ³):	55215.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.35	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 66.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	198.0 ft

2012 OBC - COMPLIANCE PACKAGE

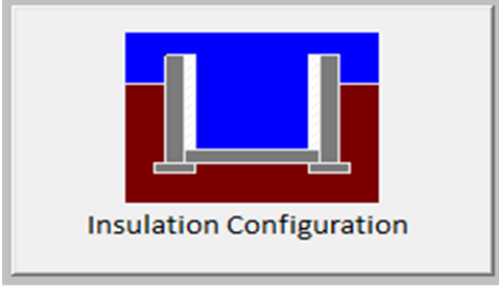
Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 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:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	20.1	 Insulation Configuration
Floor Width (m):	10.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	4.0	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1951

TYPE: 4203- THE FORESTCREST
LO# 85477

OPT ENS

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Vaughan (Woodbridge)			
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):	1563.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2084.2 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	73.2	73.2		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.340			
Cooling Air Leakage Rate (ACH/H):	0.124			

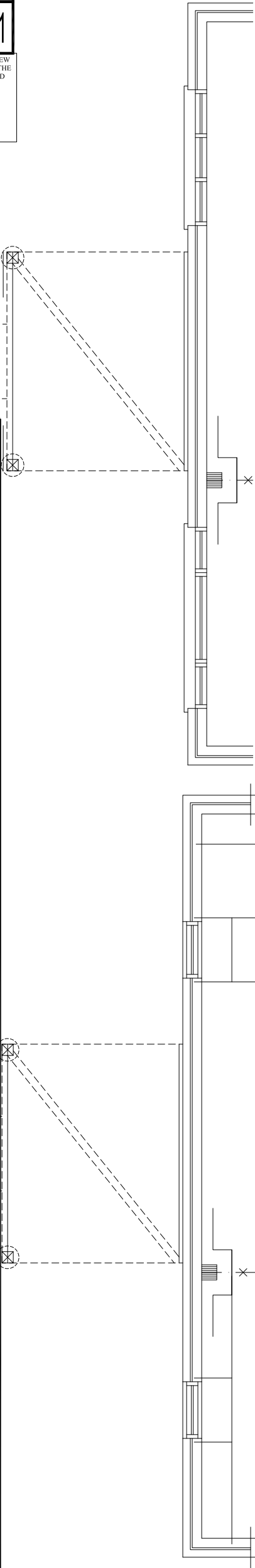
TYPE: 4203- THE FORESTCREST
LO# 85477

OPT ENS

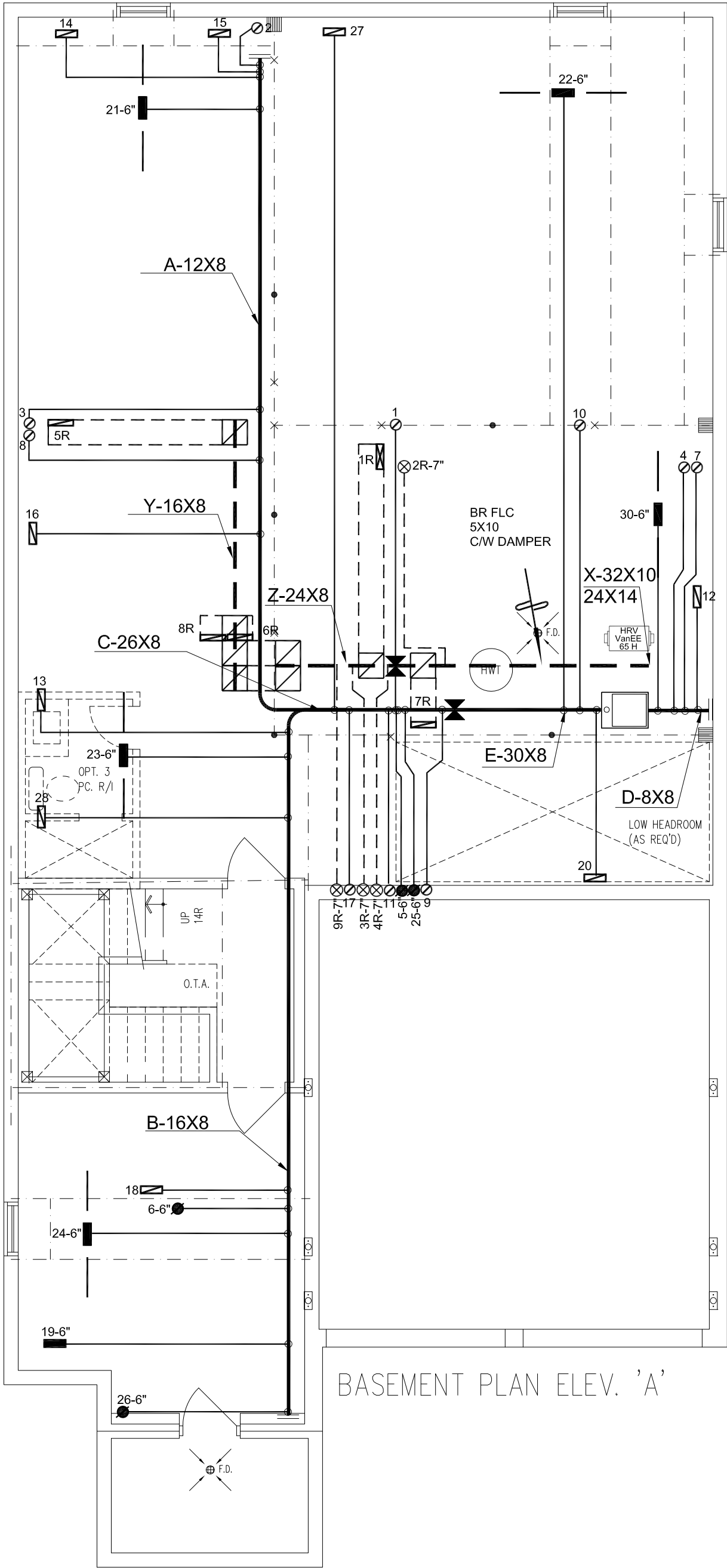
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.


Michael O'Rourke, 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.			
	SUPPLY AIR GRILLE 6' BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30'x8' RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description		
	SUPPLY AIR BOOT ABOVE		6' SUPPLY AIR STACK 2nd FLOOR		FRA-FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS			
									Date		



PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



BASEMENT PLAN ELEV. 'A'

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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@hvacadesigns.ca Web: www.hvacadesigns.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.	HEAT LOSS 72605 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title			
GOLD PARK HOMES		MAKE LENNOX		3RD FLOOR			BASEMENT HEATING LAYOUT			
Project Name		MODEL EL296UH090XE48C		2ND FLOOR	14	5				6
PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT ENSUITE THE FORESTCREST 4203 3688 sqft		INPUT 88 MBTU/H		1ST FLOOR	10	4				2
		OUTPUT 85 MBTU/H		BASEMENT			5	1	0	Date FEB/2020
	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"	
	FAN SPEED 1525 cfm @ 0.6" w.c.								BCIN# 19669	
									LO#	85477

CSA-F280-12

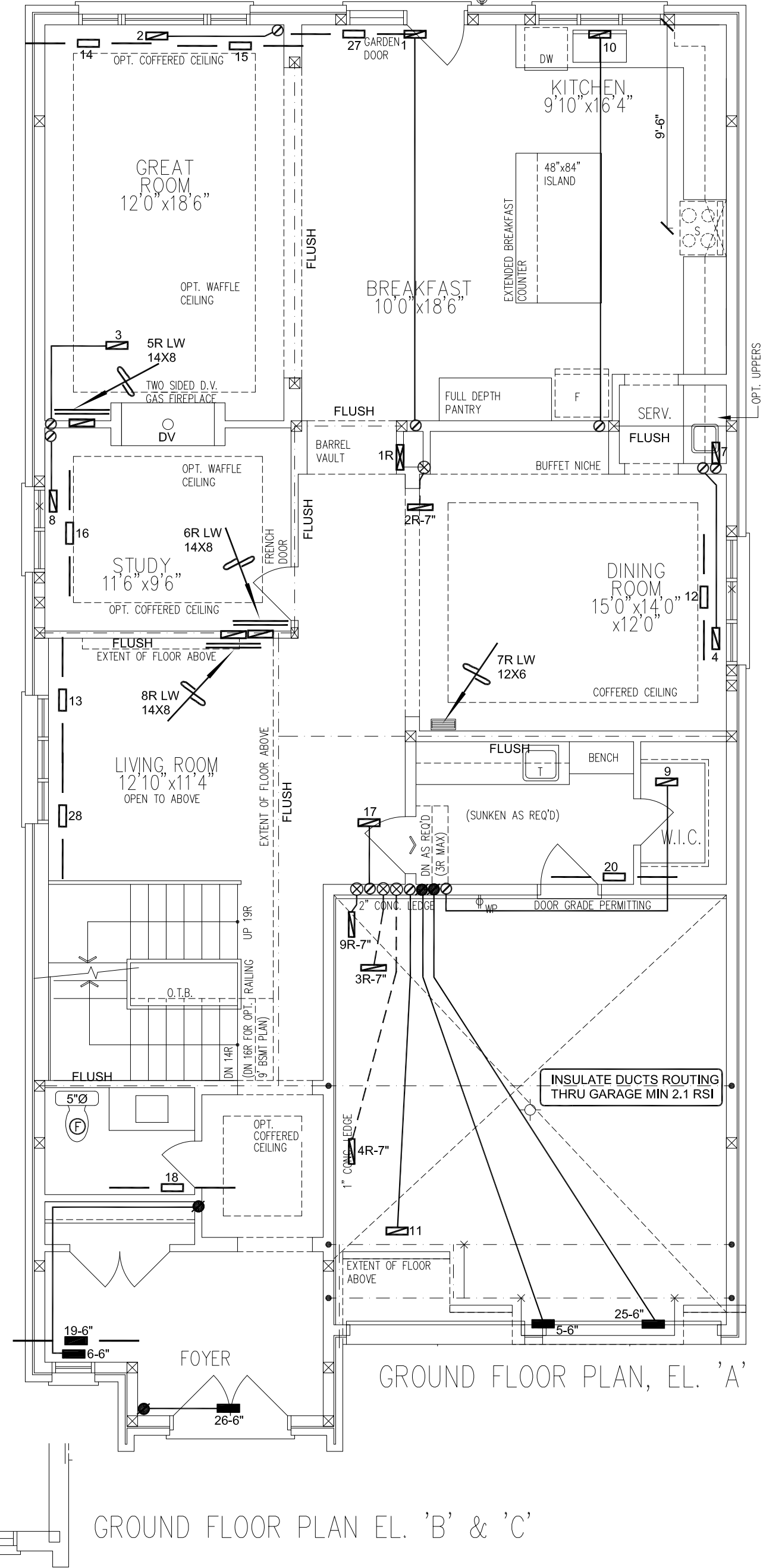
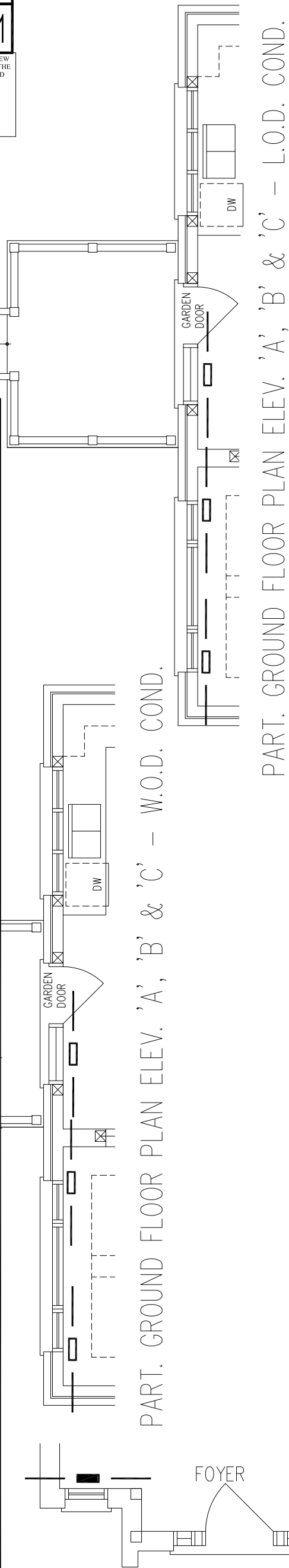
PACKAGE A1

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				
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE	1.
	SUPPLY AIR BOOT 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR	
	6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	
	RETURN AIR STACK ABOVE		RETURN AIR STACK 2nd FLOOR	
	REDUCER			
REVISIONS			Description	Date



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Client	
GOLD PARK HOMES	
Project Name	
PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT ENSUITE THE FORESTCREST 4203 3688 sqft	

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375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdsgns.ca
Specializing in Residential Mechanical Design Services

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

Sheet Title	
FIRST FLOOR HEATING LAYOUT	
Date	FEB/2020
Scale	3/16" = 1'-0"
BCIN# 19669	
LO#	85477

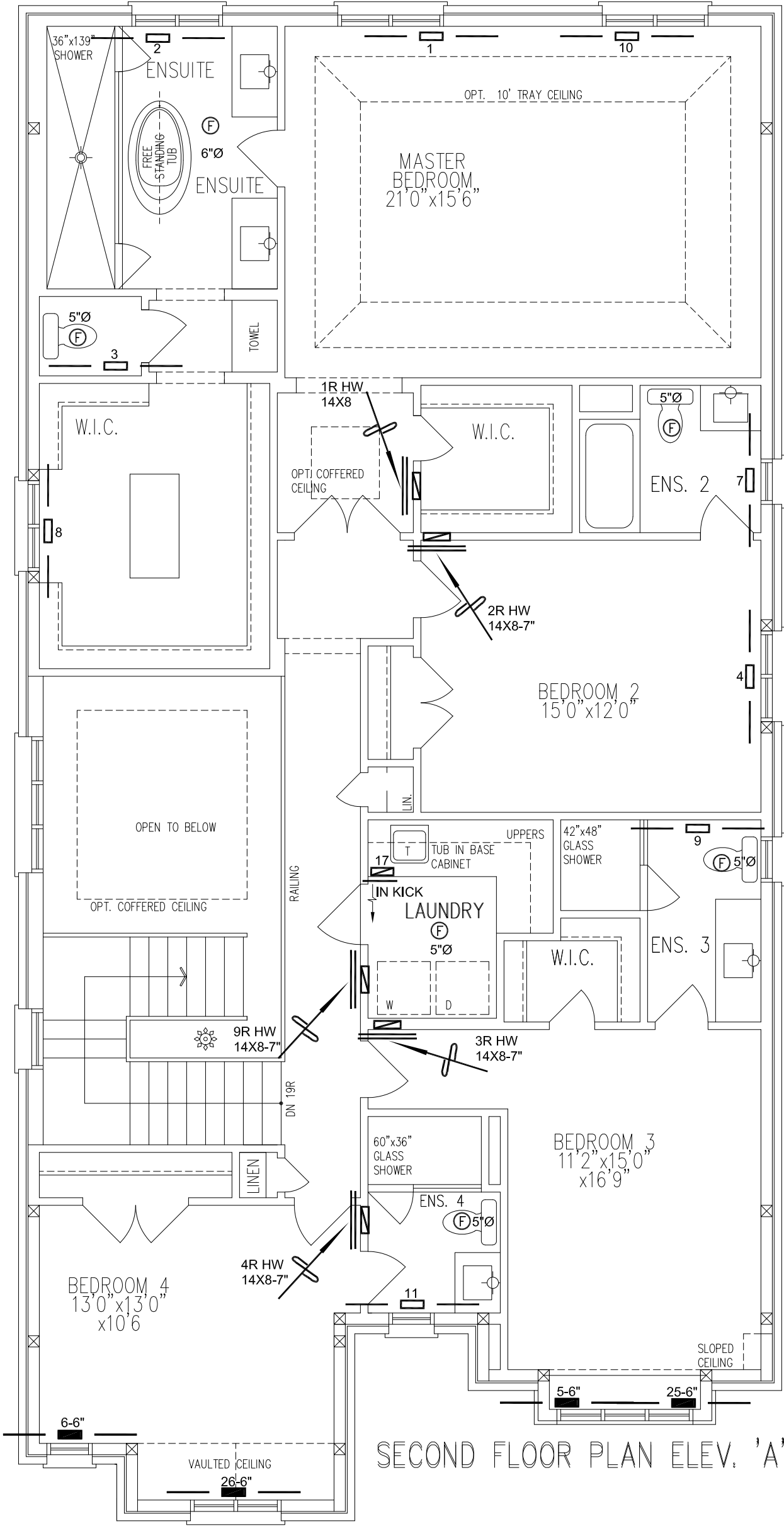
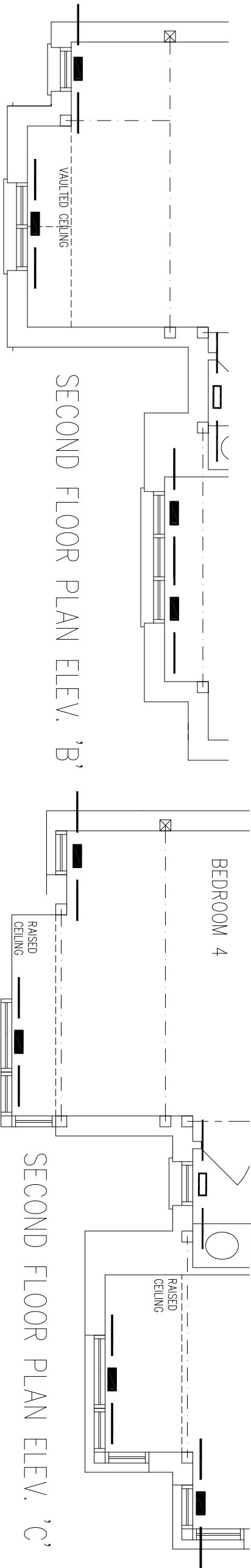
CSA-F280-12

PACKAGE A1

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



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Client

GOLD PARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT ENSUITE
THE FORESTCREST
4203 3688 sqft

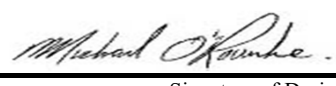
375 Finley Ave. Suite 202 - Ajax, Ontario
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Email: info@hvacdsgns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

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	
SECOND FLOOR HEATING LAYOUT	
Date	FEB/2020
Scale	3/16" = 1'-0"
BCIN# 19669	
LO#	85477

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 VAUGHAN (WOODBIDGE)	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@hvacdesigns.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: 4203- THE FORESTCREST OPT ENS - WOB Project: PINE VALLEY & TESTON	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name)		declare that (choose one as appropriate):	
☐ 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.			
February 26, 2020		 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: PINE VALLEY & TESTON										OPT ENS - WOB										DATE: Feb-20				WINTER NATURAL AIR CHANGE RATE 0.407										HEAT LOSS ΔT °F. 76				CSA-F280-12							
BUILDER: GOLD PARK HOMES										TYPE: 4203- THE FORESTCREST										GFA: 3688				LO# 85478				SUMMER NATURAL AIR CHANGE RATE 0.148										HEAT GAIN ΔT °F. 16				SB-12 PACKAGE A1			
ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2						ENS-3			ENS-4															
EXP. WALL			38			37			13			12			33			48			6						9			8															
CLG. HT.			9			9			9			12			9			9			9						9			9															
FACTORS																																													
GRS.WALL AREA			342			333			117			144			297			432			54						81			72															
GLAZING			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN									
NORTH			21.3	16.4	0	0	0	0	0	0	0	0	0	18	383	295	0	0	0	0	0	0	8	170	131		8	170	131	0	0	0													
EAST			21.3	41.1	0	0	0	0	0	0	0	0	0	0	0	0	61	1298	2509	61	1298	2509	0	0	0		0	0	0	14	298	576													
SOUTH			21.3	25.0	0	0	0	0	0	0	0	18	383	451	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0													
WEST			21.3	41.1	44	936	1810	21	447	864	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0													
SKYLT.			37.2	103.0	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			25.2	5.2	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													
NET EXPOSED WALL			4.5	0.9	298	1330	276	312	1392	289	99	442	92	126	562	117	236	1053	219	371	1656	344	46	205	43		73	326	68	58	259	54													
NET EXPOSED BSMT WALL ABOVE GR			3.6	0.7	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													
EXPOSED CLG			1.3	0.6	357	458	228	280	359	179	155	199	99	252	323	161	204	262	130	310	398	198	120	154	77		100	128	64	100	128	64													
NO ATTIC EXPOSED CLG			2.7	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	82	41	0	0	0		0	0	0	0	0	0													
EXPOSED FLOOR			2.6	0.5	0	0	0	0	0	0	0	0	0	0	0	0	204	520	108	0	0	0	0	0	0		50	128	27	100	255	53													
BASEMENT/CRAWL HEAT LOSS						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									
SUBTOTAL HT LOSS						2724			2199			1024			1269			3133			3434			530						752			940												
SUB TOTAL HT GAIN						2314			1332			641			573			2966			3092			250						289			746												
LEVEL FACTOR / MULTIPLIER			0.20	0.37				0.20	0.37				0.20	0.37				0.20	0.37				0.20	0.37				0.20	0.37				0.20	0.37											
AIR CHANGE HEAT LOSS						1020			823			383			475			1173			1285			198						281			352												
AIR CHANGE HEAT GAIN						272			157			76			67			349			364			29						34			88												
DUCT LOSS						0			0			0			0			431			0			0						103			129												
DUCT GAIN						0			0			0			0			420			0			0						32			83												
HEAT GAIN PEOPLE			240		2		480	0		0	0	0	1		240		1		240		1		240	0				0		0		0													
HEAT GAIN APPLIANCES/LIGHTS						642			0			0			642			642			642			0						0			0												
TOTAL HT LOSS BTU/H						3744			3021			1407			1744			4737			4719			728						1137			1421												
TOTAL HT GAIN x 1.3 BTU/H						4821			1935			932			1979			6002			5639			364						462			1193												

ROOM USE			DIN		LIV		KT/GT		STUDY		LAUN		PWD		FOY		MUD						WOB		BAS				
EXP. WALL			12		21		75		10		0		6		51		26						43		155				
CLG. HT.			11		20		11		11		9		11		11		12						10		10				
FACTORS																													
GRS.WALL AREA	LOSS	GAIN																											
GLAZING			132		420		825		110		0		66		561		312						430		1085				
	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN			
NORTH	21.3	16.4	32	681	525	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	66		
EAST	21.3	41.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0		
SOUTH	21.3	25.0	0	0	0	74	1575	1852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	85	100	0		
WEST	21.3	41.1	0	0	0	0	0	0	98	2085	4030	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SKYLT.	37.2	103.0	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	25.2	5.2	0	0	0	0	0	0	20	505	105	0	0	0	0	0	0	52	1313	273	20	505	105	40	1010	210	20	505	105
NET EXPOSED WALL	4.5	0.9	100	446	93	346	1544	321	707	3155	656	90	402	83	0	0	0	66	295	61	509	2272	472	292	1303	271	0	0	
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	
EXPOSED CLG	1.3	0.6	0	0	0	231	296	147	0	0	0	0	0	0	130	167	83	0	0	0	0	0	0	0	0	0	0	0	
NO ATTIC EXPOSED CLG	2.7	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EXPOSED FLOOR	2.6	0.5	0	0	0	0	0	0	0	0	0	0	60	153	32	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS						0						0						0											
SLAB ON GRADE HEAT LOSS						0			0			0			0			0											
SUBTOTAL HT LOSS				1127			3415			5746			827		320		295		3584			1808			552			2509	
SUB TOTAL HT GAIN					618		2321			4791			584		115		61		745			376			4244			4858	
LEVEL FACTOR / MULTIPLIER	0.30	0.55				0.30	0.55		0.30	0.55		0.30	0.55		0.20	0.37		0.30	0.55		0.30	0.55			2823		0.50	1.68	
AIR CHANGE HEAT LOSS				615			1863			3134			451			120		161		1955		986						15274	
AIR CHANGE HEAT GAIN					73		273			564			69		14		7		88			44						405	
DUCT LOSS				0			0			0			0		44		0		0			0						0	
DUCT GAIN					0		0			0			0		77		0		0		0	0						0	
HEAT GAIN PEOPLE	240		0		0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0		0		0	0	0	
HEAT GAIN APPLIANCES/LIGHTS					642		642			642			642		642		0		0		0	642			0			642	
TOTAL HT LOSS BTU/H				1742			5278			8879			1278		484		455		5540			2794			4795			20132	
TOTAL HT GAIN x 1.3 BTU/H					1732		4206			7796			1683		1101		89		1083			1381			3670			2165	

TOTAL HEAT GAIN BTU/H:

48895

TONS: 4.07

LOSS DUE TO VENTILATION LOAD BTU/H: 3181

STRUCTURAL HEAT LOSS: 74035

TOTAL COMBINED HEAT LOSS BTU/H: 77216



SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

OPT ENS - WOB
TYPE: 4203- THE FORESTCREST

DATE: Feb-20

GFA: 3688 LO# 85478

HEATING CFM 1525 COOLING CFM 1525
TOTAL HEAT LOSS 74,035 TOTAL HEAT GAIN 48,233
AIR FLOW RATE CFM 20.6 AIR FLOW RATE CFM 31.62

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

*LENNOX
EL296UH090XE48C

AFUE = 96 %
INPUT (BTU/H) = 88,000
OUTPUT (BTU/H) = 85,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	4	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.03 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.15 adjusted pressure r/a 0.15

FAN SPEED 90
LOW 0
MEDLOW 0
MEDIUM 1105
MEDIUM HIGH 1255
HIGH 1525

DESIGN CFM = 1525
CFM @ .6" E.S.P.

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	ENS-2	WIC	ENS-3	MBR	ENS-4	DIN	LIV	KT/GT	KT/GT	STUDY	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.87	1.51	1.51	1.74	2.37	2.36	0.73	1.41	1.14	1.87	1.42	1.74	2.64	2.96	2.96	1.28	0.48	0.46	5.54	2.79	4.99	4.99	4.99	4.99
CFM PER RUN HEAT	39	31	31	36	49	49	15	29	23	39	29	36	54	61	61	26	10	9	114	58	103	103	103	103
RM GAIN MBH	2.41	0.97	0.97	1.98	3.00	2.82	0.36	0.93	0.46	2.41	1.19	1.73	2.10	2.60	2.60	1.68	1.10	0.09	1.08	1.38	1.17	1.17	1.17	1.17
CFM PER RUN COOLING	76	31	31	63	95	89	12	29	15	76	38	55	67	82	82	53	35	3	34	44	37	37	37	37
ADJUSTED PRESSURE	0.17	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	0.16	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	46	62	59	29	47	64	21	53	42	41	42	8	28	57	49	35	32	43	55	8	68	44	24	46
EQUIVALENT LENGTH	130	160	190	160	150	170	140	180	190	130	120	90	150	130	120	140	110	140	120	130	160	150	150	110
TOTAL EFFECTIVE LENGTH	176	222	249	189	197	234	161	233	232	171	162	98	178	187	169	175	142	183	175	138	228	194	174	156
ADJUSTED PRESSURE	0.1	0.08	0.07	0.09	0.08	0.07	0.11	0.07	0.07	0.1	0.11	0.18	0.1	0.09	0.1	0.1	0.12	0.09	0.09	0.12	0.07	0.08	0.09	0.1
ROUND DUCT SIZE	5	4	4	5	6	6	4	4	4	5	4	4	5	5	5	4	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	286	356	356	264	250	250	172	333	264	286	333	413	396	448	448	298	115	103	581	665	525	525	525	525
COOLING VELOCITY (ft/min)	558	356	356	463	484	454	138	333	172	558	436	631	492	602	602	608	402	34	173	505	189	189	189	189
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	A	A	D	C	B	D	A	C	E	C	D	B	A	A	A	C	B	B	E	A	D	B	B

RUN #	25	26	27	28	30
ROOM NAME	BED-3	BED-4	KT/GT	LIV	BAS
RM LOSS MBH	2.37	2.36	2.96	2.64	4.99
CFM PER RUN HEAT	49	49	61	54	103
RM GAIN MBH	3.00	2.82	2.60	2.10	1.17
CFM PER RUN COOLING	95	89	82	67	37
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.16
ACTUAL DUCT LGH	49	66	41	31	12
EQUIVALENT LENGTH	170	130	90	130	120
TOTAL EFFECTIVE LENGTH	219	196	131	161	132
ADJUSTED PRESSURE	0.07	0.08	0.12	0.11	0.12
ROUND DUCT SIZE	6	6	5	5	6
HEATING VELOCITY (ft/min)	250	250	448	396	525
COOLING VELOCITY (ft/min)	484	454	602	492	189
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10
TRUNK	C	B	C	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	342	0.07	9.7	12	x	8	513	TRUNK G	0	0.00	0	0	8
TRUNK B	535	0.07	11.5	16	x	8	602	TRUNK H	0	0.00	0	0	8
TRUNK C	1137	0.07	14.9	26	x	8	787	TRUNK I	0	0.00	0	0	8
TRUNK D	293	0.08	8.9	10	x	8	527	TRUNK J	0	0.00	0	0	8
TRUNK E	1234	0.07	15.7	30	x	8	740	TRUNK K	0	0.00	0	0	8
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	8

RETURN AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK O	0	0.06	0	0	x	8
TRUNK P	0	0.06	0	0	x	8
TRUNK Q	0	0.06	0	0	x	8
TRUNK R	0	0.06	0	0	x	8
TRUNK S	0	0.06	0	0	x	8
TRUNK T	0	0.06	0	0	x	8
TRUNK U	0	0.06	0	0	x	8
TRUNK V	0	0.06	0	0	x	8
TRUNK W	0	0.06	0	0	x	8
TRUNK X	1525	0.06	17.7	32	x	10
TRUNK Y	485	0.06	11.5	16	x	8
TRUNK Z	915	0.06	14.6	24	x	8
DROP	1525	0.06	17.7	24	x	14

RETURN AIR #	1	2	3	4	5	6	7	8	9	
AIR VOLUME	175	125	125	130	155	175	155	155	125	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH	48	46	47	56	47	32	23	33	48	1
EQUIVALENT LENGTH	165	185	205	145	200	195	205	195	190	0
TOTAL EFFECTIVE LH	213	231	252	201	247	227	228	228	238	1
ADJUSTED PRESSURE	0.07	0.06	0.06	0.07	0.06	0.07	0.06	0.06	0.06	14.80
ROUND DUCT SIZE	7.5	6.9	6.9	6.8	7.5	7.5	7.5	6.9	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0
	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	14	14	0	0

TYPE: 4203- THE FORESTCREST
SITE NAME: PINE VALLEY & TESTON

LO # 85478
OPT ENS - WOB

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	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>7</u> @ 10.6 cfm	<u>74.2</u> cfm
Table 9.32.3.A.	TOTAL	<u>212.0</u> cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		<u>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>212</u>	cfm
Less Principal Ventil. Capacity	<u>155</u>	cfm
Required Supplemental Capacity	<u>57.0</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model:	VANEE 65H		
Location:	BSMT		
<u>155.0</u> cfm	<u>3.0</u> sones		
☒ HVI Approved			
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
155.0 CFM	X 76 F	X 1.08	X 0.25

SUPPLEMENTAL FANS		NUTONE	
Location	Model	cfm	HVI
ENS	QTXEN050C	50	☒
ENS-2	QTXEN050C	50	☒
ENS-4	QTXEN050C	50	☒
PWD	QTXEN050C	50	☒

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model:	VANEE 65H	
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER:	
GOLD PARK HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

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

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	February-20

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 85478	Model: 4203- THE FORESTCREST	Builder: GOLD PARK HOMES	Date: 2/26/2020																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <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>1728</td><td>10</td><td>17280</td></tr> <tr><td>First</td><td>1728</td><td>11</td><td>19008</td></tr> <tr><td>Second</td><td>2103</td><td>9</td><td>18927</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>55,215.0 ft³</td></tr> <tr><td colspan="3" style="text-align: right;">Total:</td><td>1563.5 m³</td></tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1728	10	17280	First	1728	11	19008	Second	2103	9	18927	Third	0	9	0	Fourth	0	9	0	Total:			55,215.0 ft³	Total:			1563.5 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 30%; text-align: center;">0.407</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.148</td> </tr> </table> <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 style="text-align: center;">22</td> <td style="text-align: center;">-20</td> <td style="text-align: center;">42</td> <td style="text-align: center;">76</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">22</td> <td style="text-align: center;">31</td> <td style="text-align: center;">9</td> <td style="text-align: center;">16</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.407	SUMMER NATURAL AIR CHANGE RATE	0.148	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-20	42	76	Summer DTDc	22	31	9	16
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.407 x 434.31 x 42 °C x 1.2 = 8953 W = 30549 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.148 x 434.31 x 9 °C x 1.2 = 678 W = 2313 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 16 °F x 1.08 x 0.25 = 661 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	30,549	9,101	1.678																																																								
2	0.3		16,802	0.545																																																								
3	0.2		16,324	0.374																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4203- THE FORESTCREST	OPT ENS - WOB	BUILDER: GOLD PARK HOMES
SFQT: 3688	LO# 85478	SITE: PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
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 (ft ³):	55215.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 66.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	155.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	43.0 ft

2012 OBC - COMPLIANCE PACKAGE

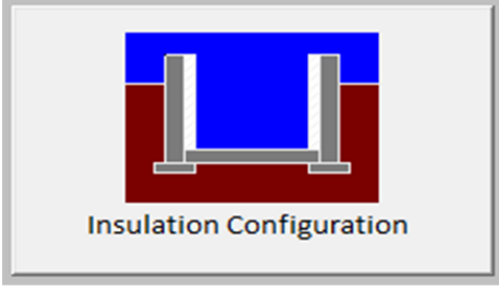
Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 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

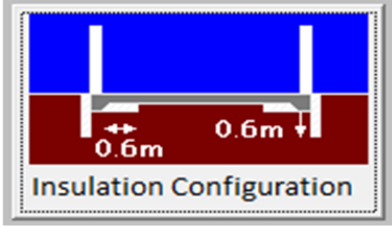
Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	 Insulation Configuration
Floor Width (m):	10.1	
Exposed Perimeter (m):	47.2	
Wall Height (m):	3.0	
Depth Below Grade (m):	1.79	
Window Area (m ²):	0.7	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		735

TYPE: 4203- THE FORESTCREST
LO# 85478

OPT ENS - WOB

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	1.5	
Width (m):	10.1	
Exposed Perimeter (m):	13.1	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		162

TYPE: 4203- THE FORESTCREST
LO# 85478

OPT ENS - WOB

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Vaughan (Woodbridge)			
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):	9.14			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1563.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2084.2 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	73.2	73.2		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.407			
Cooling Air Leakage Rate (ACH/H):	0.148			

TYPE: 4203- THE FORESTCREST
LO# 85478

OPT ENS - WOB

CSA-F280-12

WOB

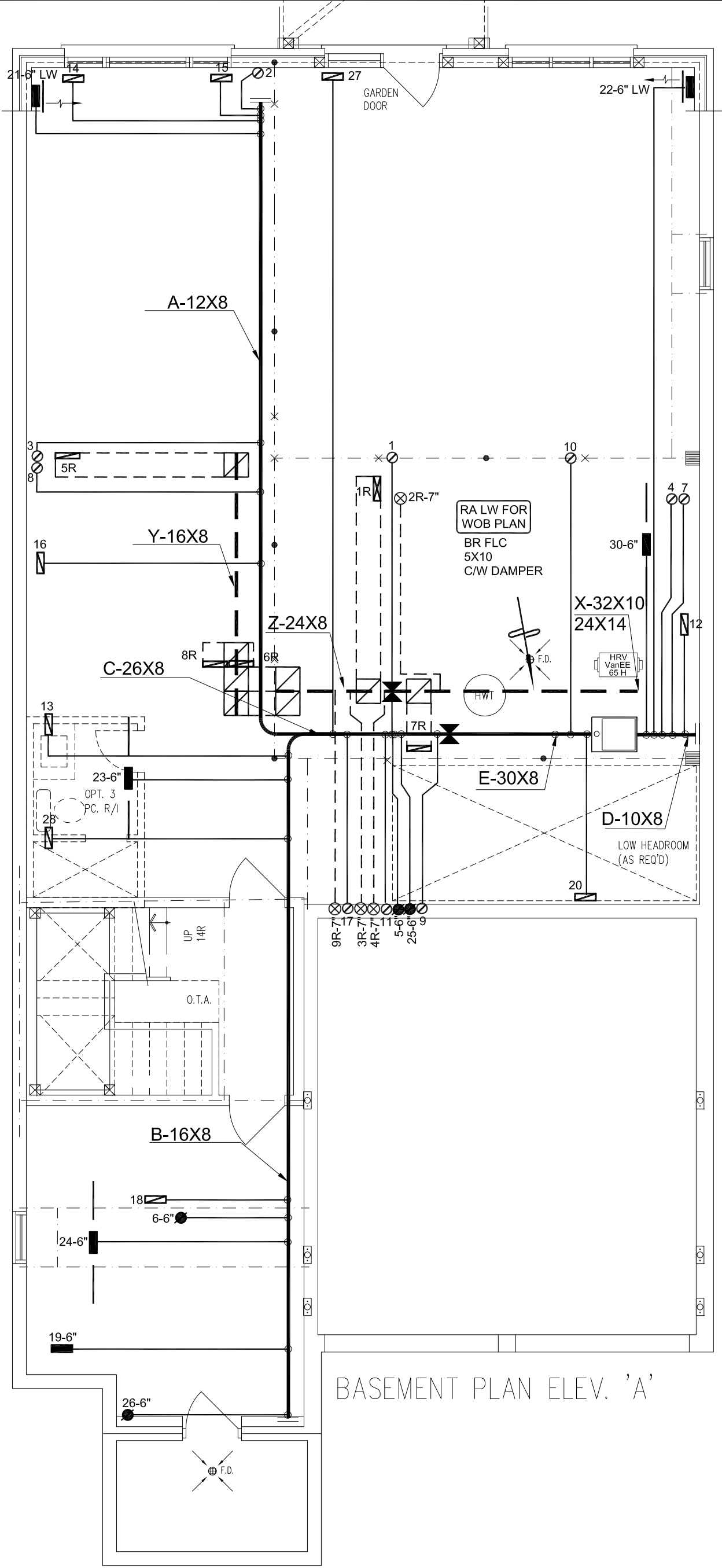
PACKAGE A1

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		
	SUPPLY AIR GRILLE		2.	
	SUPPLY AIR GRILLE 6\"/>		1.	
	SUPPLY AIR BOOT ABOVE		No.	
	SUPPLY AIR STACK 2nd FLOOR			
	FRA-FLOOR RETURN AIR GRILLE			
	RETURN AIR STACK ABOVE			
	REDUCER			
REVISIONS			Description	Date



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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 77216 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title		
GOLD PARK HOMES		MAKE LENNOX		3RD FLOOR			BASEMENT HEATING LAYOUT		
Project Name		MODEL EL296UH090XE48C		2ND FLOOR	14	5			6
PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT ENSUITE THE FORESTCREST - WOB 4203 3688 sqft		INPUT 88 MBTU/H		1ST FLOOR	10	4			2
		OUTPUT 85 MBTU/H	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				Date	FEB/2020	
	COOLING 4.0 TONS					Scale	3/16" = 1'-0"		
	FAN SPEED 1525 cfm @ 0.6" w.c.					BCIN# 19669			
						LO#	85478		

CSA-F280-12

WOB

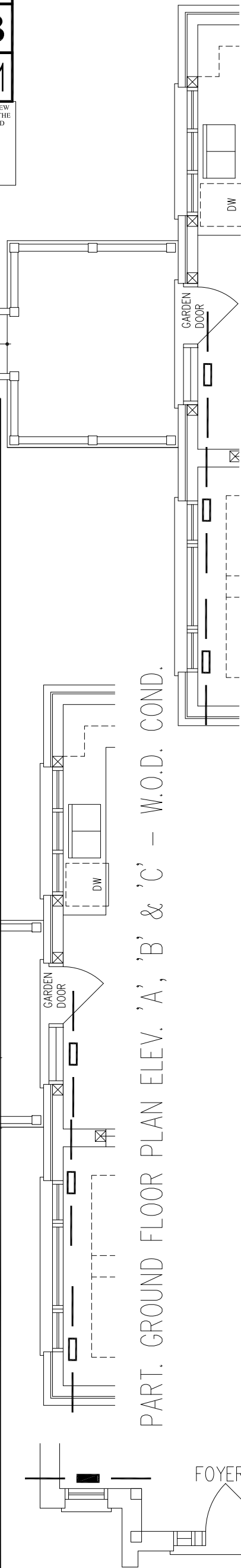
PACKAGE A1

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

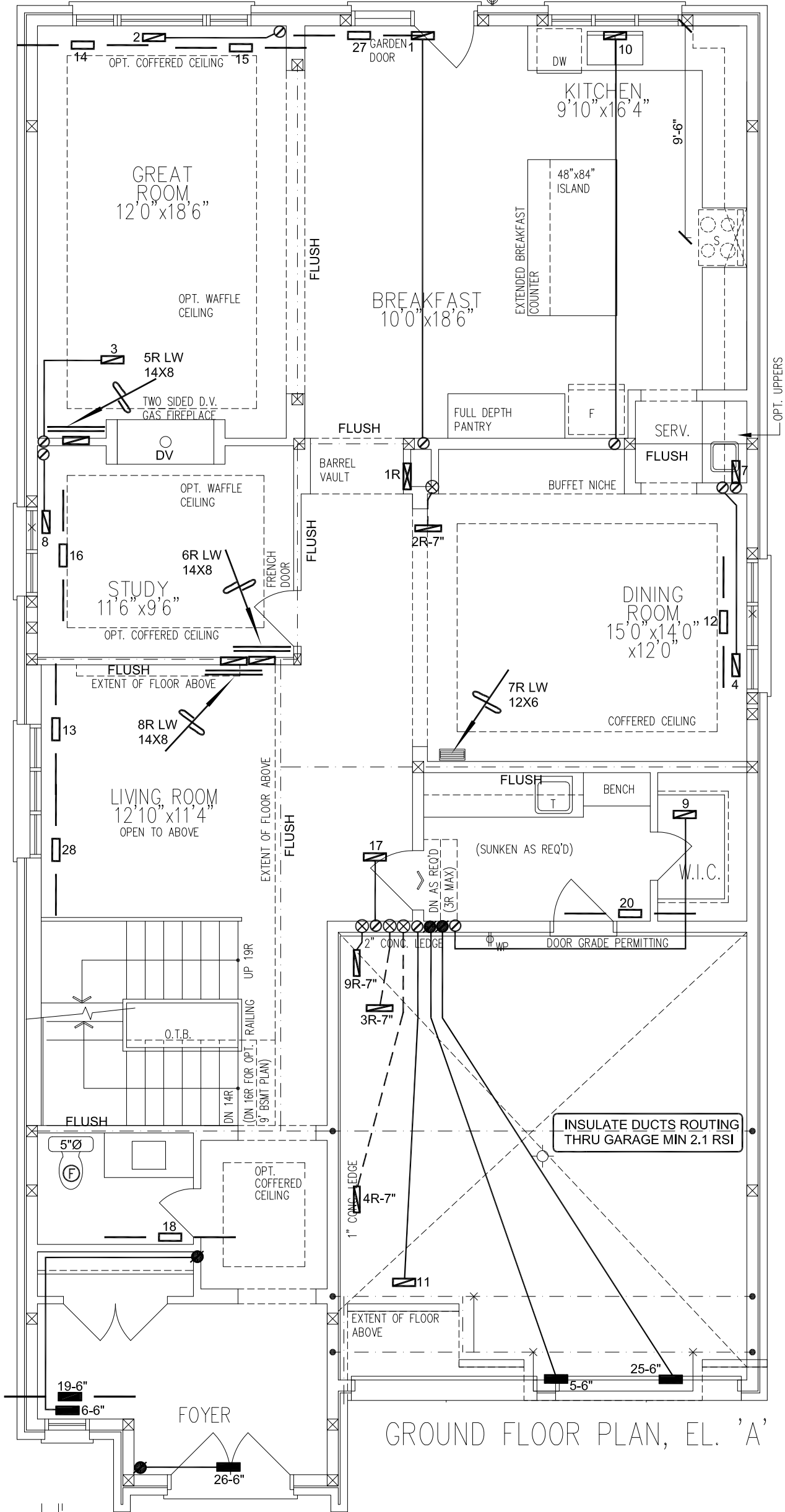
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	3.
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK FROM 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	2.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		RETURN AIR STACK ABOVE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

HVAC LEGEND



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.

PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.



GROUND FLOOR PLAN, EL. 'A'

GROUND FLOOR PLAN EL. 'B' & 'C'

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Client	GOLD PARK HOMES
Project Name	PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT ENSUITE THE FORESTCREST - WOB 4203 3688 sqft

HVACDESIGNS LTD.

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

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

Sheet Title	FIRST FLOOR HEATING LAYOUT
Date	FEB/2020
Scale	3/16" = 1'-0"
BCIN#	19669
LO#	85478

CSA-F280-12

WOB

PACKAGE A1

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

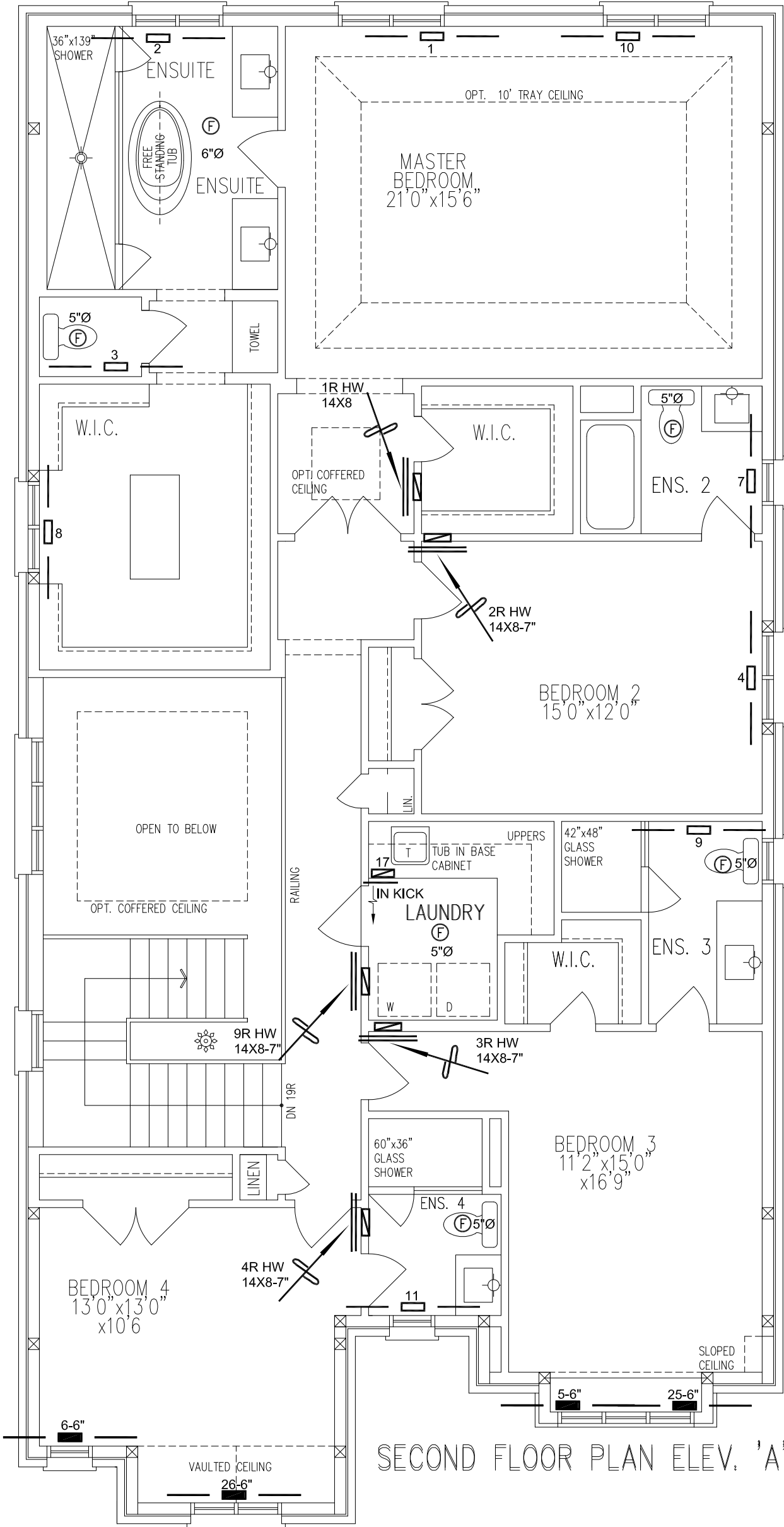
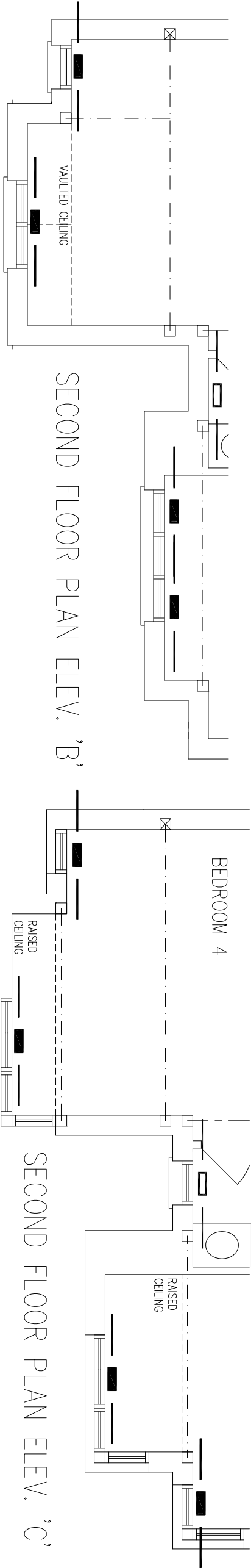
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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

HVAC LEGEND

SECOND FLOOR PLAN ELEV. 'B'

SECOND FLOOR PLAN ELEV. 'C'



SECOND FLOOR PLAN ELEV. 'A'

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Client	GOLD PARK HOMES
Project Name	PINE VALLEY & TESTON VAUGHAN, ONTARIO OPT ENSUITE THE FORESTCREST - WOB 4203 3688 sqft

HVACDESIGNS LTD.

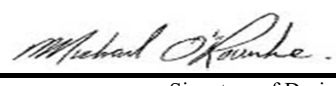
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Sheet Title	SECOND FLOOR HEATING LAYOUT
Date	FEB/2020
Scale	3/16" = 1'-0"
BCIN#	19669
LO#	85478

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 VAUGHAN (WOODBIDGE)	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@hvacdesigns.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: 4203- THE FORESTCREST WOB Project: PINE VALLEY & TESTON	
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.			
February 25, 2020		 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

[illegible]

TOTAL COMBINED HEAT LOSS BTU/H: 77308

SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

WOB
TYPE: 4203- THE FORESTCREST

DATE: Feb-20

GFA: 3688 LO# 79976

HEATING CFM 1525 COOLING CFM 1525
TOTAL HEAT LOSS 74,127 TOTAL HEAT GAIN 48,192
AIR FLOW RATE CFM 20.57 AIR FLOW RATE CFM 31.64

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

^LENNOX
EL296UH090XE48C

AFUE = 96 %
INPUT (BTU/H) = 88,000
OUTPUT (BTU/H) = 85,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	10	5
R/A	0	0	5	4	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.03 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.15 adjusted pressure r/a 0.15

FAN SPEED 90
LOW 0
MEDLOW 0
MEDIUM 1105
MEDIUM HIGH 1255
HIGH 1525

DESIGN CFM = 1525
CFM @ .6" E.S.P.

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	ENS-2	LOFT	ENS-3	MBR	ENS-4	DIN	LIV	KT/GT	KT/GT	STUDY	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.87	1.51	1.51	1.74	2.37	2.27	0.73	0.98	1.14	1.87	1.42	1.74	2.64	2.96	2.96	1.28	0.48	0.46	5.54	2.79	5.01	5.01	5.01	5.01
CFM PER RUN HEAT	39	31	31	36	49	47	15	20	23	39	29	36	54	61	61	26	10	9	114	57	103	103	103	103
RM GAIN MBH	2.29	0.90	0.90	1.83	2.86	2.64	0.33	1.53	0.41	2.29	1.13	1.59	1.96	2.46	2.46	1.56	1.00	0.07	0.85	1.20	1.57	1.57	1.57	1.57
CFM PER RUN COOLING	73	28	28	58	91	84	10	48	13	73	36	50	62	78	78	49	32	2	27	38	50	50	50	50
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	46	62	72	29	47	64	21	53	42	41	42	8	28	57	49	35	32	43	55	8	63	43	24	46
EQUIVALENT LENGTH	130	160	140	160	150	170	140	180	190	130	120	90	150	130	120	140	110	140	120	130	180	150	150	110
TOTAL EFFECTIVE LENGTH	176	222	212	189	197	234	161	233	232	171	162	98	178	187	169	175	142	183	175	138	243	193	174	156
ADJUSTED PRESSURE	0.1	0.08	0.08	0.09	0.08	0.07	0.11	0.07	0.07	0.1	0.11	0.18	0.1	0.09	0.1	0.1	0.12	0.09	0.09	0.12	0.07	0.08	0.09	0.1
ROUND DUCT SIZE	5	4	4	5	6	6	4	5	4	5	4	4	5	5	5	4	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	286	356	356	264	250	240	172	147	264	286	333	413	396	448	448	298	115	103	581	654	525	525	525	525
COOLING VELOCITY (ft/min)	536	321	321	426	464	428	115	352	149	536	413	574	455	573	573	562	367	23	138	436	255	255	255	255
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	A	A	D	C	B	D	A	E	E	C	D	B	A	A	A	C	B	B	E	A	D	B	B

RUN #	25	26	27	28	29	30
ROOM NAME	BED-3	BED-4	KT/GT	LIV	HERS	BAS
RM LOSS MBH	2.37	2.27	2.96	2.64	0.55	5.01
CFM PER RUN HEAT	49	47	61	54	11	103
RM GAIN MBH	2.86	2.64	2.46	1.96	0.14	1.57
CFM PER RUN COOLING	91	84	78	62	5	50
ADJUSTED PRESSURE	0.16	0.16	0.17	0.17	0.17	0.16
ACTUAL DUCT LGH	49	66	41	31	73	12
EQUIVALENT LENGTH	170	130	90	130	180	120
TOTAL EFFECTIVE LENGTH	219	196	131	161	253	132
ADJUSTED PRESSURE	0.07	0.08	0.13	0.11	0.07	0.12
ROUND DUCT SIZE	6	6	5	5	4	6
HEATING VELOCITY (ft/min)	250	240	448	396	126	525
COOLING VELOCITY (ft/min)	464	428	573	455	57	255
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	4X10
TRUNK	C	B	C	B	A	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	344	0.07	9.7	12	x 8	516	TRUNK G	0	0.00	0	0 x 8 0
TRUNK B	531	0.07	11.4	16	x 8	597	TRUNK H	0	0.00	0	0 x 8 0
TRUNK C	1112	0.07	15.1	26	x 8	770	TRUNK I	0	0.00	0	0 x 8 0
TRUNK D	293	0.08	8.9	10	x 8	527	TRUNK J	0	0.00	0	0 x 8 0
TRUNK E	1231	0.07	15.7	28	x 8	791	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

	TRUNK	STATIC	ROUND	RECT	VELOCITY
	CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK O	0	0.06	0	0	x 8 0
TRUNK P	0	0.06	0	0	x 8 0
TRUNK Q	0	0.06	0	0	x 8 0
TRUNK R	0	0.06	0	0	x 8 0
TRUNK S	0	0.06	0	0	x 8 0
TRUNK T	0	0.06	0	0	x 8 0
TRUNK U	0	0.06	0	0	x 8 0
TRUNK V	0	0.06	0	0	x 8 0
TRUNK W	0	0.06	0	0	x 8 0
TRUNK X	1525	0.06	17.7	32	x 10 686
TRUNK Y	485	0.06	11.5	16	x 8 546
TRUNK Z	915	0.06	14.6	24	x 8 686
DROP	1525	0.06	17.7	24	x 14 654

RETURN AIR #	1	2	3	4	5	6	7	8	9	BR
AIR VOLUME	175	125	125	130	155	175	155	155	125	0 205
PLENUM PRESSURE	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	48	46	47	56	47	32	23	33	48	1 1 1 1 14
EQUIVALENT LENGTH	165	185	205	145	200	195	205	195	190	0 0 0 0 145
TOTAL EFFECTIVE LH	213	231	252	201	247	227	228	228	238	1 1 1 1 159
ADJUSTED PRESSURE	0.07	0.06	0.06	0.07	0.06	0.07	0.06	0.06	0.06	14.80 14.80 14.80 14.80 14.80 0.09
ROUND DUCT SIZE	7.5	6.9	6.9	6.8	7.5	7.5	7.5	6.9	0	0 0 0 0 7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0 0 0 0 8
	X	X	X	X	X	X	X	X	X	X X X X X
INLET GRILL SIZE	14	14	14	14	14	14	14	14	0	0 0 0 0 14

TYPE: 4203- THE FORESTCREST
SITE NAME: PINE VALLEY & TESTON

LO # 79976
WOB

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	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>8</u> @ 10.6 cfm	<u>84.8</u> cfm
Table 9.32.3.A. TOTAL		<u>222.6</u> cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		<u>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>222.6</u>	cfm
Less Principal Ventil. Capacity	<u>155</u>	cfm
Required Supplemental Capacity	<u>67.6</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model: VANEE 65H	Location: BSMT		
<u>155.0</u> cfm	<u>3.0</u> sones ☒ HVI Approved		
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
155.0 CFM	X 76 F	X 1.08	X 0.25

SUPPLEMENTAL FANS		NUTONE		
Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	☒	0.3
ENS-2	QTXEN050C	50	☒	0.3
ENS-4	QTXEN050C	50	☒	0.3
PWD	QTXEN050C	50	☒	0.3

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER:		GOLD PARK HOMES
Name:		
Address:		
City:		
Telephone #:	Fax #:	

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

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	February-20

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 79976	Model: 4203- THE FORESTCREST	Builder: GOLD PARK HOMES	Date: 2/25/2020																																																									
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House Volume <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>1728</td> <td>10</td> <td>17280</td> </tr> <tr> <td>First</td> <td>1728</td> <td>11</td> <td>19008</td> </tr> <tr> <td>Second</td> <td>2103</td> <td>9</td> <td>18927</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>55,215.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1563.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1728	10	17280	First	1728	11	19008	Second	2103	9	18927	Third	0	9	0	Fourth	0	9	0	Total:			55,215.0 ft³	Total:			1563.5 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%; text-align: center;">0.407</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.137</td> </tr> </table> <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>T_{in} °C</th> <th>T_{out} °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTD_h</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-20</td> <td style="text-align: center;">42</td> <td style="text-align: center;">76</td> </tr> <tr> <td>Summer DTD_c</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.407	SUMMER NATURAL AIR CHANGE RATE	0.137	Design Temperature Difference						T _{in} °C	T _{out} °C	ΔT °C	ΔT °F	Winter DTD _h	22	-20	42	76	Summer DTD _c	24	31	7	13
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Summer DTD _c	24	31	7	13																																																								
5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.407 x 434.31 x 42 °C x 1.2 = 8953 W = 30549 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.137 x 434.31 x 7 °C x 1.2 = 506 W = 1726 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 13 °F x 1.08 x 0.25 = 536 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{clevel})																																																								
1	0.5	30,549	9,234	1.654																																																								
2	0.3		16,802	0.545																																																								
3	0.2		16,282	0.375																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HL_{airbv} = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HL_{airve} = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4203- THE FORESTCREST	WOB	BUILDER: GOLD PARK HOMES
SFQT: 3688	LO# 79976	SITE: PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
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:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	55215.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 66.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	155.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	43.0 ft

2012 OBC - COMPLIANCE PACKAGE

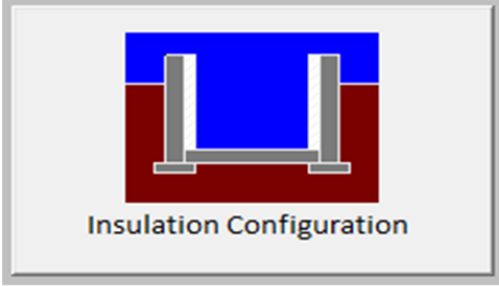
Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 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

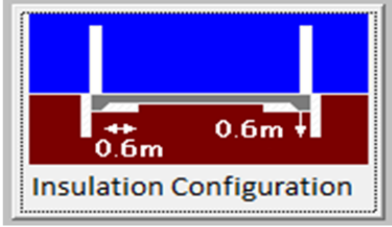
Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	 Insulation Configuration
Floor Width (m):	10.1	
Exposed Perimeter (m):	47.2	
Wall Height (m):	3.0	
Depth Below Grade (m):	1.79	
Window Area (m ²):	0.7	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		735

TYPE: 4203- THE FORESTCREST
LO# 79976

WOB

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	1.5	
Width (m):	10.1	
Exposed Perimeter (m):	13.1	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		162

TYPE: 4203- THE FORESTCREST
LO# 79976

WOB

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Vaughan (Woodbridge)			
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):	9.14			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1563.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2084.2 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	73.2	73.2		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.407			
Cooling Air Leakage Rate (ACH/H):	0.137			

TYPE: 4203- THE FORESTCREST
LO# 79976

WOB

CSA-F280-12

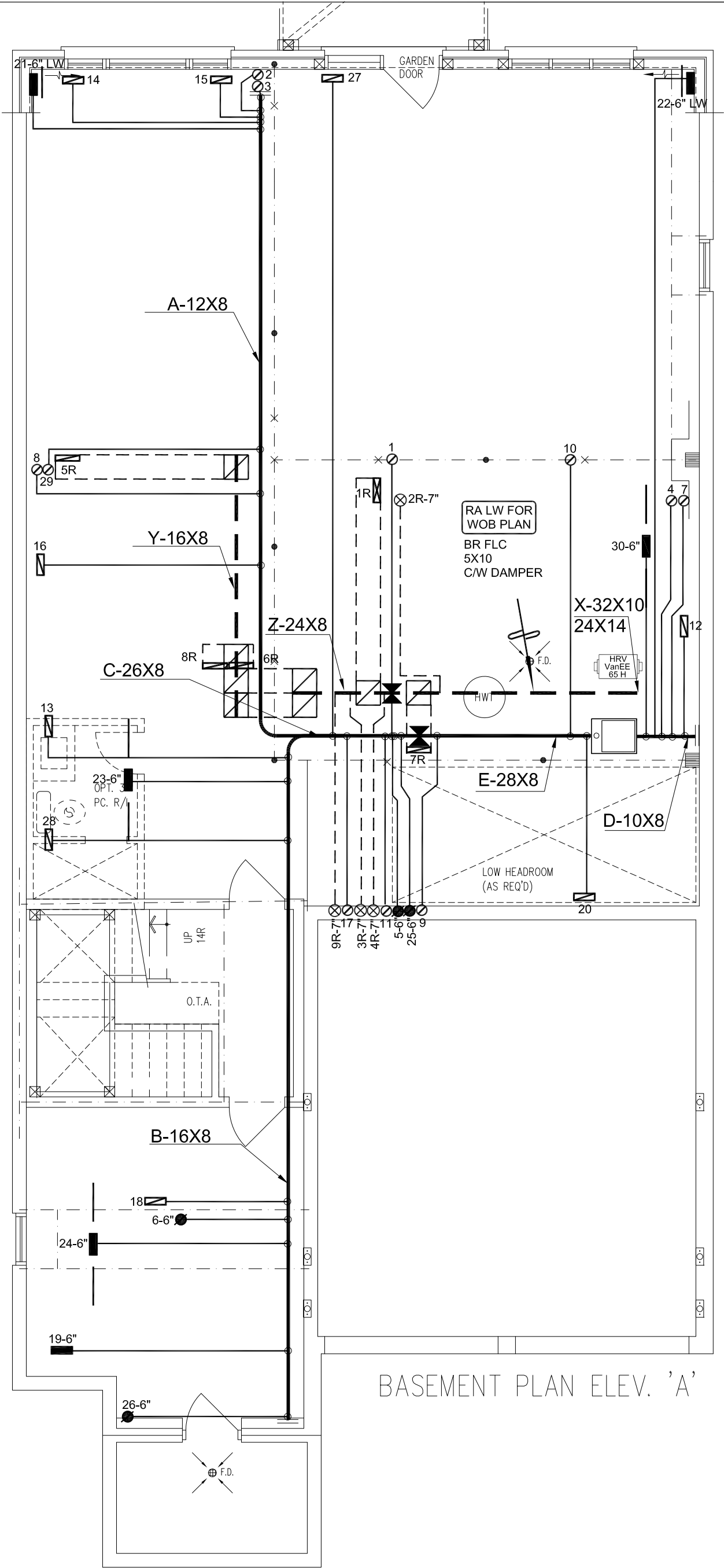
PACKAGE A1

WOB

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

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

HVAC LEGEND				
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE	1.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR	REVISIED AS PER ARCHITECTURALS
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR	2.
	SUPPLY AIR GRILLE		FRA-FLOOR RETURN AIR GRILLE	3.
	RETURN AIR STACK ABOVE		RETURN AIR STACK 2nd FLOOR	
	REDUCER			
REVISIONS			No.	Date



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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 Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	HEAT LOSS 77308 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title			
GOLD PARK HOMES		MAKE LENNOX		3RD FLOOR			BASEMENT HEATING LAYOUT			
Project Name		MODEL EL296UH090XE48C		2ND FLOOR	15	5				6
PINE VALLEY & TESTON VAUGHAN, ONTARIO		INPUT 88 MBTU/H		1ST FLOOR	10	4				2
THE FORESTCREST - WOB 4203 3688 sqft		OUTPUT 85 MBTU/H		BASEMENT	5	1	0	Date	SEPT/2018	
	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"		
	FAN SPEED 1525 cfm @ 0.6" w.c.						BCIN# 19669			
							LO#	79976		

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

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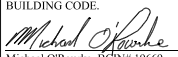
Sheet Title	
FIRST FLOOR HEATING LAYOUT	
Date	SEPT/2018
Scale	3/16" = 1'-0"
BCIN# 19669	
LO#	79976

CSA-F280-12

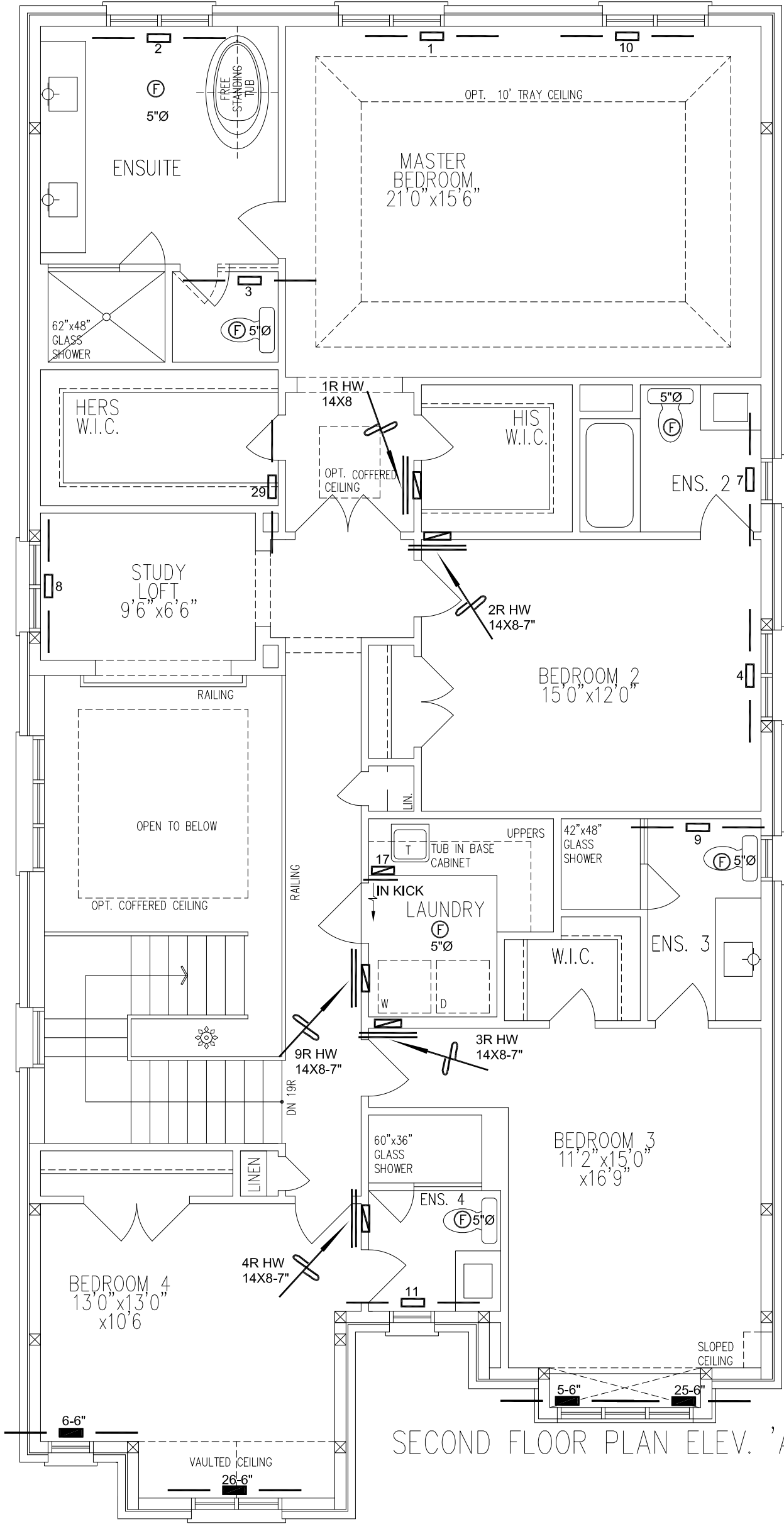
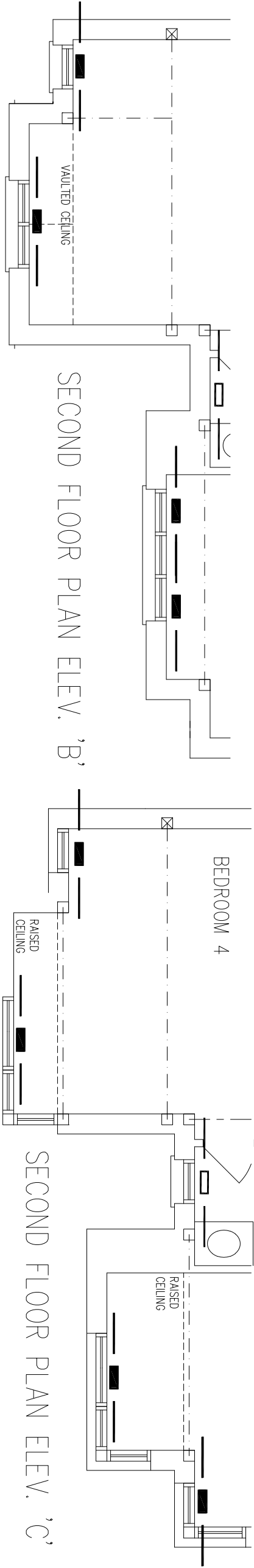
PACKAGE A1

WOB

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, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND					
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		SUPPLY AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		REDUCER
			REVISIONS		
			No.	Description	Date
			1.	REVISED AS PER ARCHITECTURALS	FEB/2020



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GOLD PARK HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2018
PINE VALLEY & TESTON VAUGHAN, ONTARIO			Scale	3/16" = 1'-0"
THE FORESTCREST - WOB 4203 3688 sqft			BCIN# 19669	
			LO#	79976