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	**Postal code**	**Plan number/ other description**		
VAUGHAN (WOODBRIDGE)				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			Unit no.	Lot/con.
375 FINLEY AVE			**202**	**N/A**
Municipality	Postal code	Province	E-mail	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	Fax number		Cell number	
(**905**) **619-2300**	(**905**) **619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

❑ House	☒ HVAC – House	❑ Building Structural
❑ Small Buildings	❑ Building Services	❑ Plumbing – House
❑ Large Buildings	❑ Detection, Lighting and Power	❑ Plumbing – All Buildings
❑ Complex Buildings	❑ Fire Protection	❑ 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 **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

❑ 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
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

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	LOSS	GAIN	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
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	18	383	451	0	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		
SLAB ON GRADE HEAT LOSS			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		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	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	132			420			825			110			0			66			561			312			430			1085		
GLAZING				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	0	0	0	0	4	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	0	0	0	0	0	0	0	0
SOUTH	21.3	25.0	0	0	0	74	1575	1852	0	0	0	20	426	501	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	85	100
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	56	1192	2303	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	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	334	1491	310	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	0	0	0	465	1673	348
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						2509		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			552					
SUBTOTAL HT LOSS			1127			3415			5746			827			320			295			3584			1808			4244			4858		
SUB TOTAL HT GAIN					618			2321			4791			584			115			61			745			376			2823			619
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		0.30	0.55					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
HEAT GAIN PEOPLE	240		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			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

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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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
plenum 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

^LENNOX
EL296UH090XE48C 90

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

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

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

TEMPERATURE RISE 52 °F

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	342	0.07	9.7	12	x	8	513	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	535	0.07	11.5	16	x	8	602	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	1137	0.07	14.9	26	x	8	787	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	1234	0.07	15.7	30	x	8	740	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 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
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
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	175	125	125	130	155	175	155	155	125	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
ACTUAL DUCT LGH.	48	46	47	56	47	32	23	33	48	1	1	1	1	1	1	14
EQUIVALENT LENGTH	165	185	205	145	200	195	205	195	190	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	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	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	7.5
INLET GRILL SIZE	8	8	8	8	8	8	6	8	8	0	0	0	0	0	0	8
	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	14

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: 4203- THE FORESTCREST LO # 85478
SITE NAME: PINE VALLEY & TESTON 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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	6	@ 10.6 cfm	63.6	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	212.0	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED — 9.32.3.4.(1)

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

SUPPLEMENTAL VENTILATION CAPACITY — 9.32.3.5.

Total Ventilation Capacity	212	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	57.0	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 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

155 cfm high 64 cfm low

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

LOCATION OF INSTALLATION

Lot: Concession

Township Plan:

Address

Roll # Building Permit #

BUILDER: 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: Michael O'Rourke.

HRAI # 001820

Date: February-20

I REVIEW AND TAKE RESPONIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

HVAC DESIGNS LTD.

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 85478 Model: 4203- THE FORESTCREST Builder: GOLD PARK HOMES Date: 2/26/2020

Volume Calculation

House Volume

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

Air Change & Delta T Data

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

5.2.3.1 Heat Loss due to Air Leakage

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

0.407 x 434.31 x 42 °C x 1.2 = 8953 W

= **30549 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 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

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

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	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

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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

Michael O'Rourke

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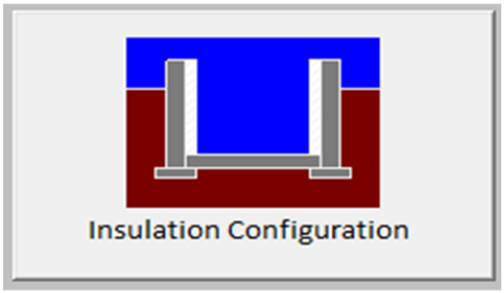
Residential Foundation Thermal Load Calculator

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**	

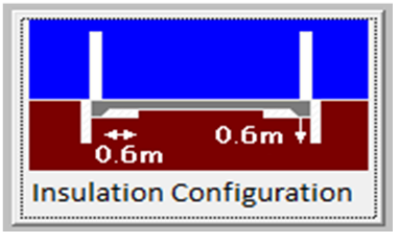
TYPE: 4203- THE FORESTCREST OPT ENS - WOB
LO# 85478

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

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	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 OPT ENS - WOB
LO# 85478

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

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	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 73.2 / Total Exhaust 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 OPT ENS - WOB

LO# 85478

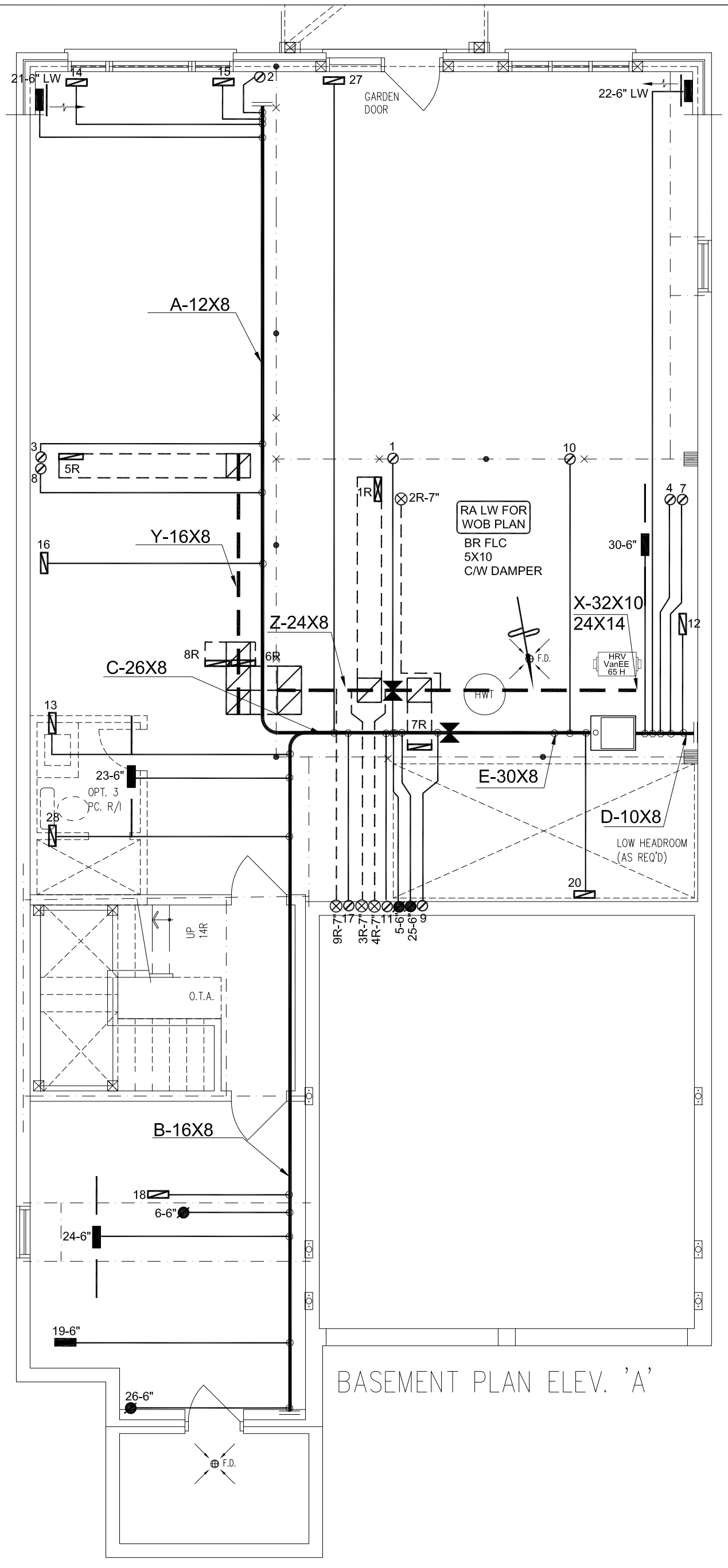
CSA-F280-12

WOB

PACKAGE A1

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.



BASEMENT PLAN ELEV. 'A'

HVAC LEGEND

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

REVISIONS

No.	Description	Date
1.		
2.		
3.		

Client

GOLD PARK HOMES

Project Name

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

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
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Email: info@hvacdesigns.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.

HEAT LOSS 77216 BTU/H	
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH090XE48C
INPUT	88 MBTU/H
OUTPUT	85 MBTU/H
COOLING	4.0 TONS
FAN SPEED	1525 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	14	5	6
1ST FLOOR	10	4	2
BASEMENT	5	1	0

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

Sheet Title

BASEMENT HEATING LAYOUT

Date FEB/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 85478

CSA-F280-12

WOB

PACKAGE A1

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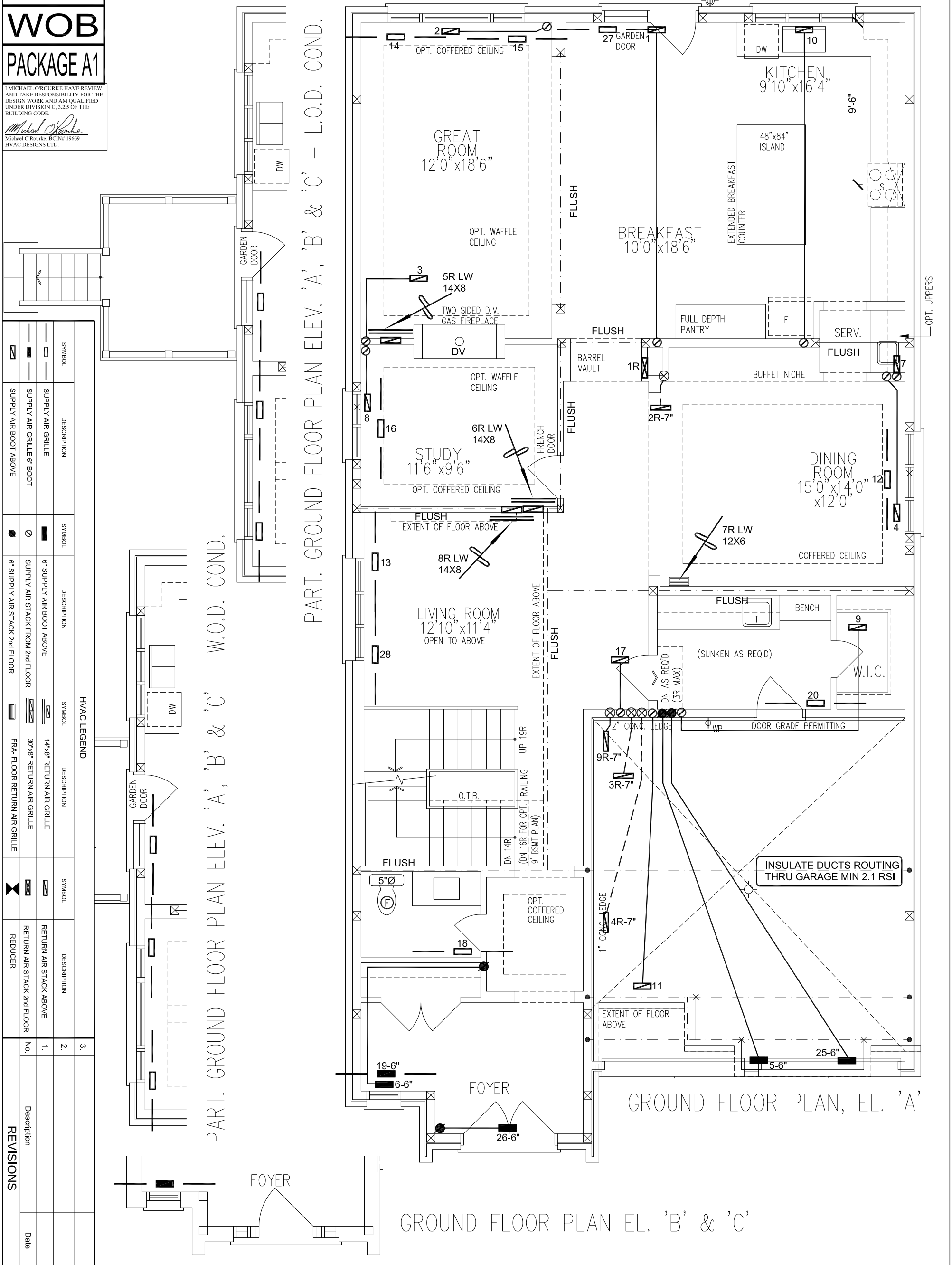

HVAC LEGEND

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

REVISIONS

No.	Description	Date
1.		
2.		
3.		

Client
GOLD PARK HOMES

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

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

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date FEB/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 85478

CSA-F280-12
WOB
PACKAGE A1

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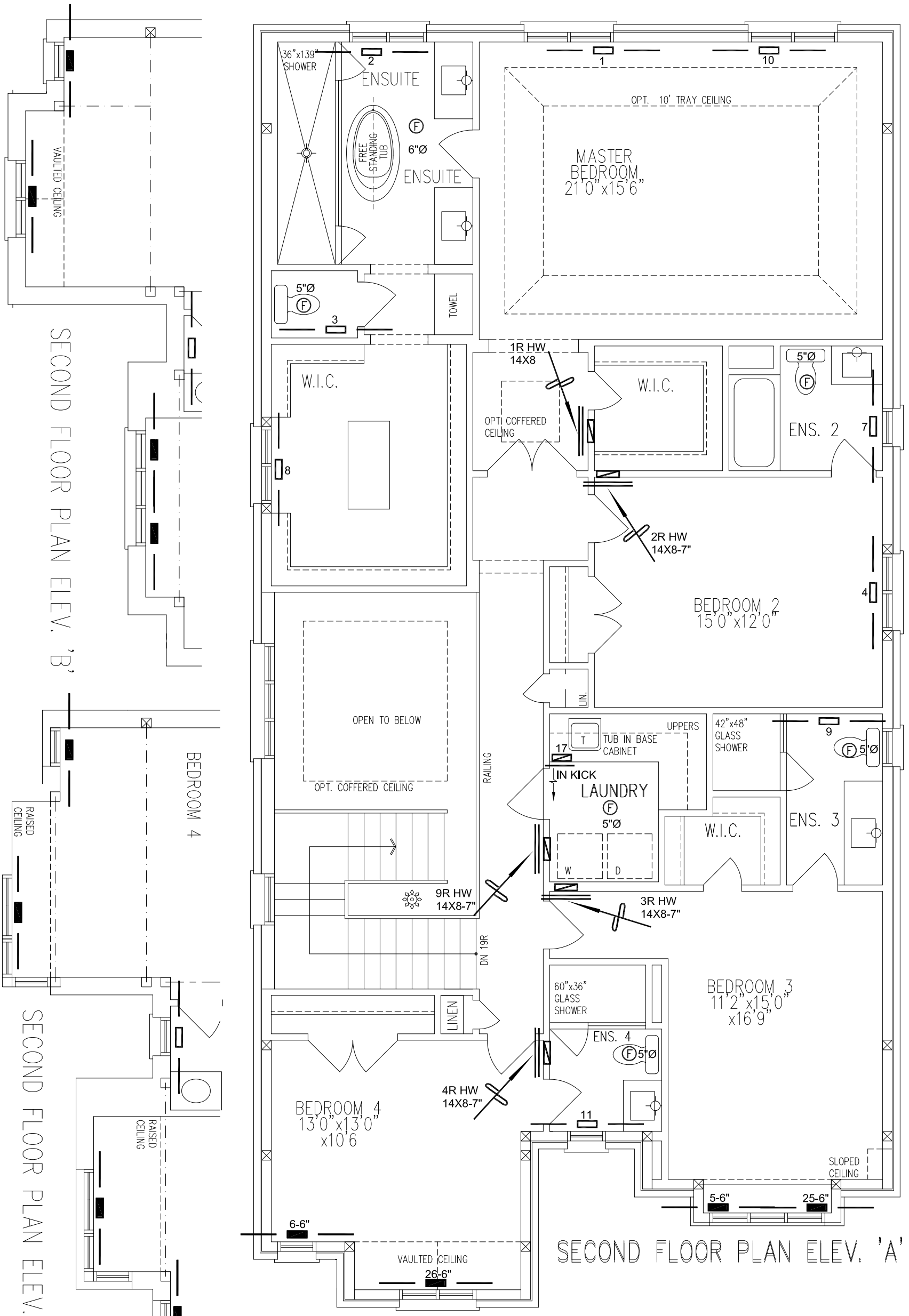

HVAC LEGEND

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

REVISIONS

No.	Description	Date
1.		
2.		
3.		

Client
GOLD PARK HOMES

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

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

Sheet Title
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 85478