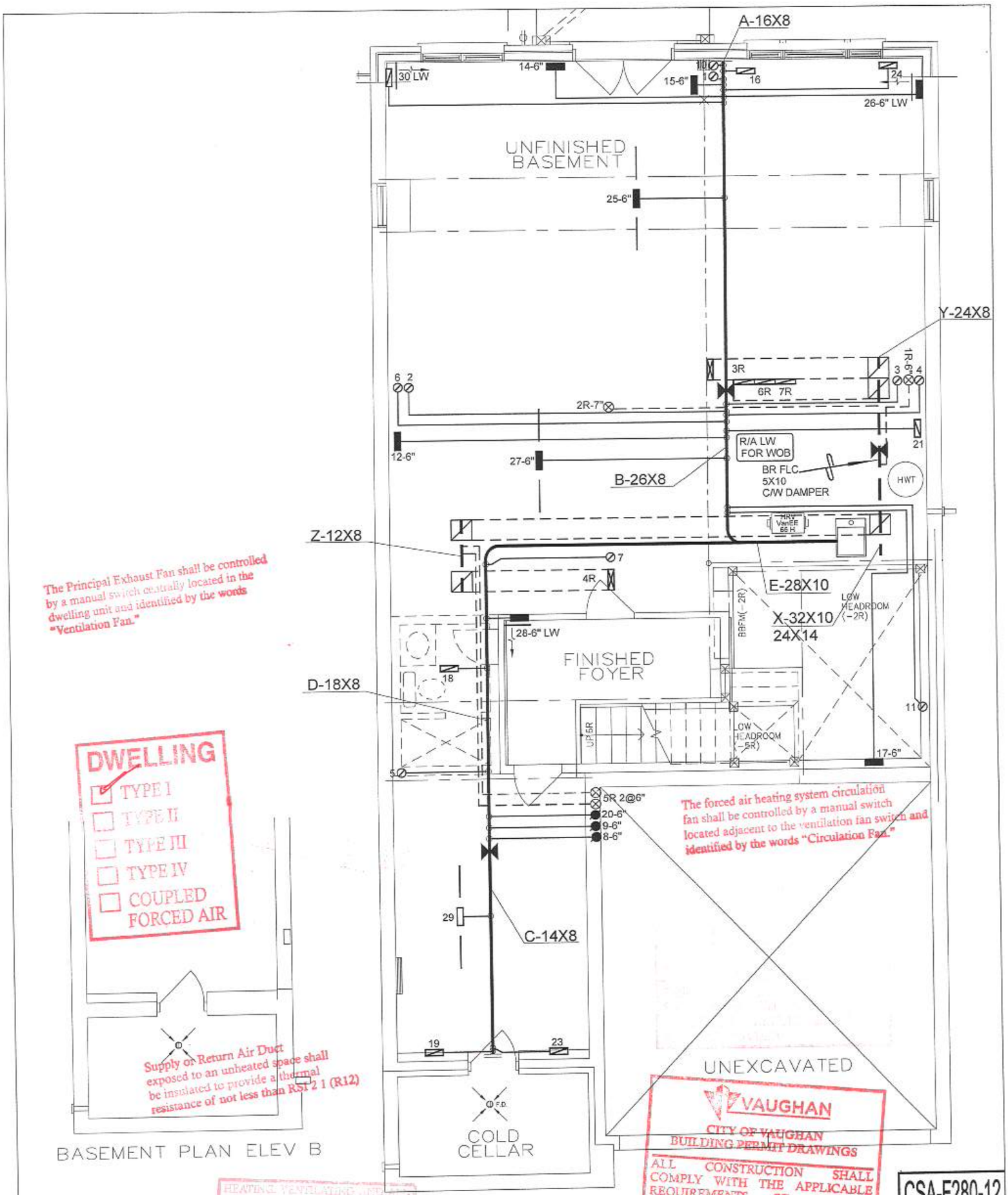

The Principal Exhaust Fan shall be controlled by a manual switch centrally located in the dwelling unit and identified by the words "Ventilation Fan."

The forced air heating system circulation fan shall be controlled by a manual switch located adjacent to the ventilation fan switch and identified by the words "Circulation Fan."

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

HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS SHALL BE DESIGNED, CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF DIVISION B, SECTIONS 6 AND 9 OF THE ONTARIO BUILDING CODE.

VAUGHAN
CITY OF VAUGHAN
BUILDING PERMIT DRAWINGS
ALL CONSTRUCTION SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF ONTARIO REGULATION 332/12, (AS AMENDED), THE 2012 BUILDING CODE AND UNDER THE BUILDING CODE ACT

CSA-F280-12
WOB PACKAGE A1

HVAC LEGEND

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

No.	Description	Date
3.		
2.		
1.		

REVISIONS

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Client
GOLD PARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

THE BROOKSIDE WOB
4003 3296 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 67620 BTU/H

UNIT DATA

MAKE	LENNOX
MODEL	EL296UH090XE48C
INPUT	88 MBTU/H
OUTPUT	85 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1525 cfm @ 0.6" w.c.

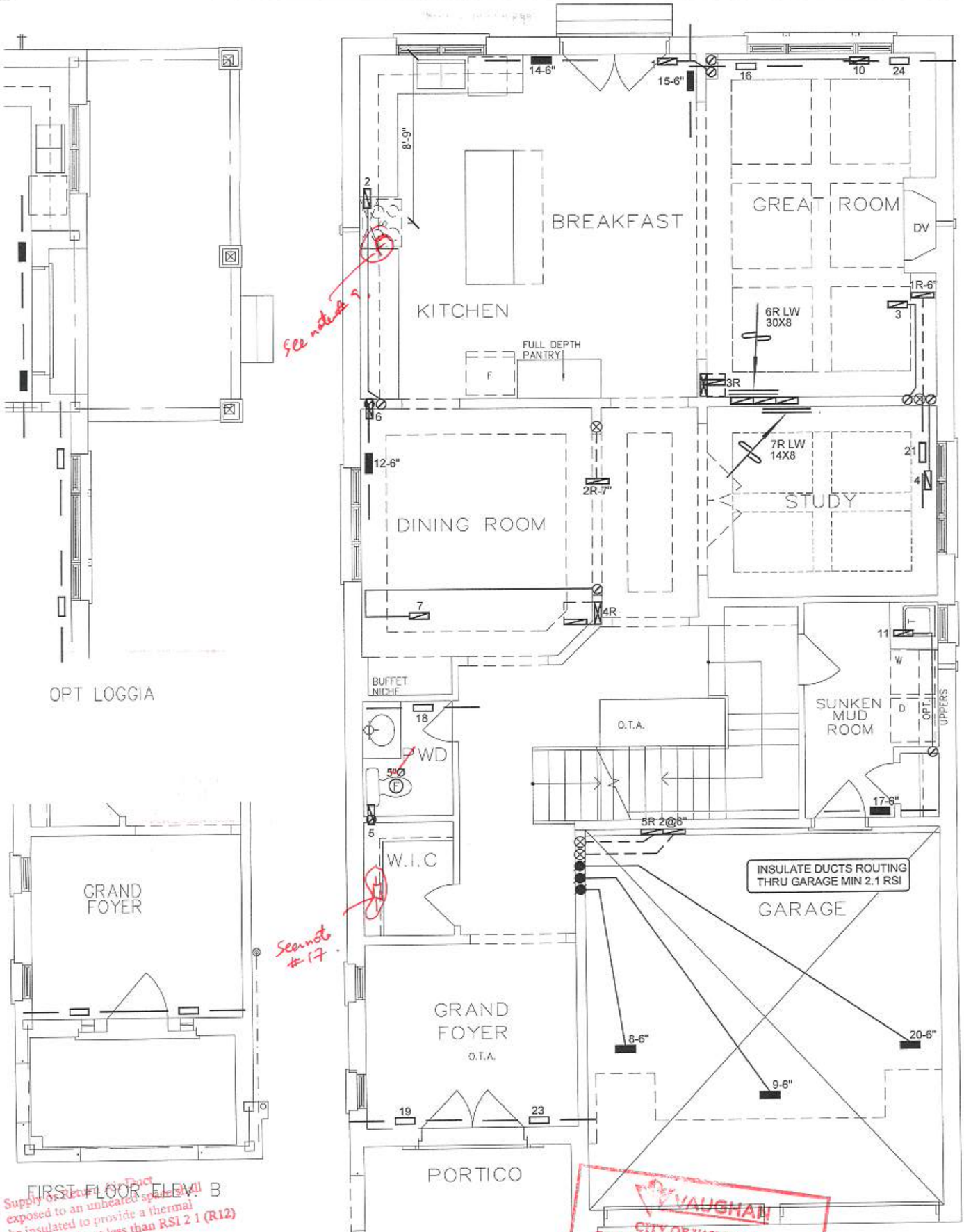
# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	5	3
1ST FLOOR	10	2	2
BASEMENT	6	1	0

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 OCT/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 80232

Please see back side for notes →



Supply ducts in attic shall be exposed to an unheated space and be insulated to provide a thermal resistance of not less than RSI 2.1 (R12)

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.

CITY OF VAUGHAN
BUILDING PERMIT DRAWINGS
ALL CONSTRUCTION SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF ONTARIO REGULATION 332/12, (AS AMENDED) THE 2012 BUILDING CODE, MADE UNDER THE BUILDING CODE ACT

CSA-F280-12

WOB | PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x6" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	FLOOR SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x6" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		8" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.		

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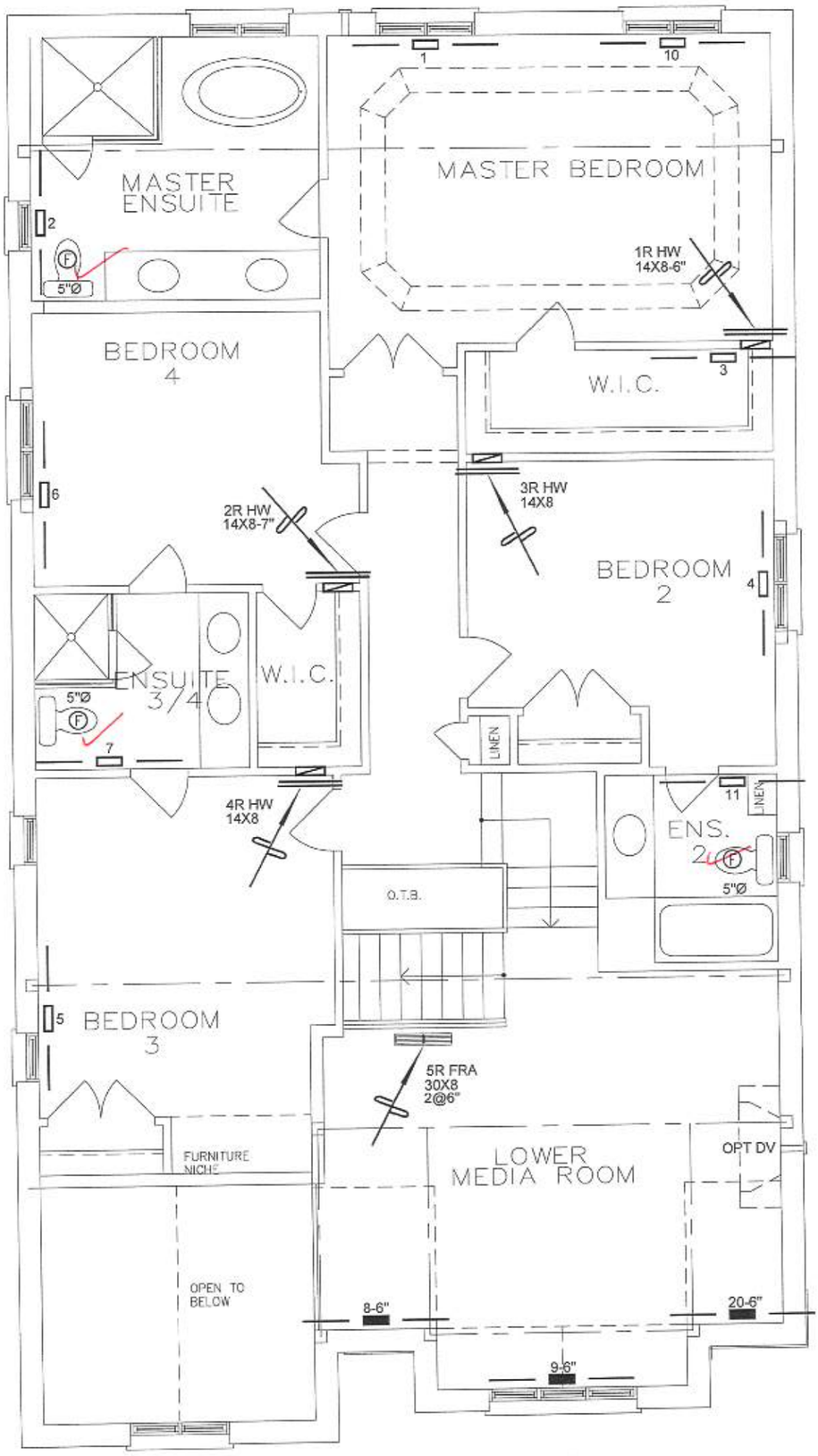
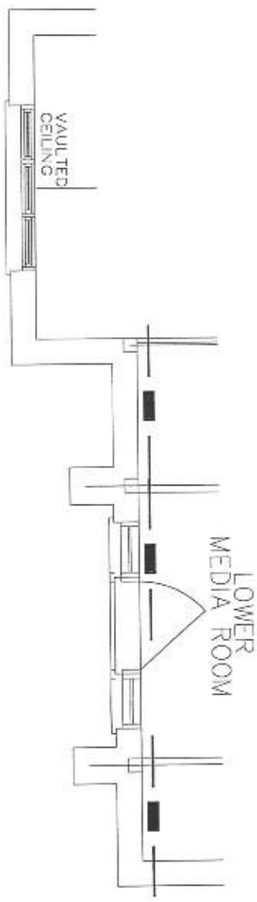
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date OCT/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 80232





SECOND FLOOR ELEV. B

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

HEATING, VENTILATING AND AIR CONDITIONING SYSTEM SHALL BE EXECUTED AND INSTALLED IN ACCORDANCE WITH THE PROVINCIAL ONTARIO BUILDING CODE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	FLOOR SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date OCT/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 80232

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 (WOODBRIDGE)	Postal code	Plan number/ other description M4647		

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		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) 619-2376		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: 4003 THE BROOKSIDE
WOB
Project: PINE VALLEY & TESTON

D. Declaration of Designer

I MICHAEL O'ROURKE (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: 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.

October 5, 2018
Date

Signature of Designer

VAUGHAN
CITY OF VAUGHAN
BUILDING PERMIT DRAWINGS
ALL CONSTRUCTION SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF ONTARIO REGULATION 332/12, (AS AMENDED), THE 2012 BUILDING CODE, MADE UNDER THE BUILDING CODE ACT

FEB 2020

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.

20-120003-GLD-00-CM

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
BUILDER: GOLD PARKHOMES

WOB
TYPE: 4003 THE BROOKSIDE
GFA: 3296

DATE: Oct-18
LOW 80232

WINTER NATURAL AIR CHANGE RATE 0.400
SUMMER NATURAL AIR CHANGE RATE 0.134

HEAT LOSS AT °F. 76
HEAT GAIN AT °F. 13

CSA-F280-12
SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH						ENS-2		
EXP. WALL			33			25			5			13			15			12			7						8		
CLG. HT.			9			9			9			9			9			9			9						9		
	FACTORS																												
GRS.WALL AREA	LOSS	GAIN	300			228			45			118			137			105			54						73		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN				LOSS	GAIN	
NORTH	21.3	16.0	0	0	0	0	0	0	0	0	0	17	362	272	0	0	0	0	0	0	0	0	0				8	170	128
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
SOUTH	21.3	24.9	0	0	0	9	192	224	0	0	0	0	0	0	18	383	448	17	362	423	0	0	0				0	0	0
WEST	21.3	41.6	34	724	1413	17	362	706	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	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
DOORS	25.2	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0
NET EXPOSED WALL	4.5	0.8	266	1188	200	202	899	151	46	203	34	101	452	76	119	529	89	92	411	69	54	234	43				65	289	49
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
EXPOSED CLG	1.3	0.6	290	372	170	156	200	92	70	90	41	234	300	138	195	250	115	166	213	98	98	126	58				64	82	38
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
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0						0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0						0	
SUBTOTAL HT LOSS				2284			1653			293			1114			1162			185			410						562	
SUB TOTAL HT GAIN					1783			1174			75			485			652			890			106						214
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	
AIR CHANGE HEAT LOSS				839			607			108			409			427			362			151						199	
AIR CHANGE HEAT GAIN					154			191			7			42			56			67			8						18
DUCT LOSS				0			0			0			0			0			0			0						0	
DUCT GAIN					0			0			0			0			0			0			0						0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0				0		0
HEAT GAIN APPLIANCES/LIGHTS					615			0			0			615			615			615			0						0
TOTAL HT LOSS BTU/H				3123			2260			400			1523			1589			1349			561						741	
TOTAL HT GAIN x 1.3 BTU/H					3942			1857			105			1797			2032			1945			149						302

ROOM USE			MEDIA			DIN			KT/GR			STDY				WIR			FOY			MUD					WOB			BAS		
EXP. WALL			40			23			70			11				12			43			25					42			140		
CLG. HT.			14			11			11			11				11			11			12					9			9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	560			253			770			121				132			473			300					382			354		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN				LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	0	0	0	32	681	511		0	0	0	0	0	0	9	192	144			0	0	0	3	64	48
EAST	21.3	41.6	55	1170	2285	0	0	0	0	0	0	0	0	0		0	0	0	42	894	1745	0	0	0			0	0	0	0	0	0
SOUTH	21.3	24.9	0	0	0	34	724	847	0	0	0	0	0	0		0	0	0	23	489	573	0	0	0			0	0	0	3	64	75
WEST	21.3	41.6	0	0	0	0	0	0	108	2298	4488	0	0	0		0	0	0	0	0	0	0	0	0			92	1958	3823	0	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	0	0
DOORS	25.2	4.3	10	252	43	0	0	0	10	252	43	0	0	0		0	0	0	40	1010	170	20	505	85			10	252	43	20	505	85
NET EXPOSED WALL	4.5	0.8	495	2209	372	219	977	165	652	2910	490	89	397	67		132	589	99	368	1642	277	271	1209	204			280	1250	211	0	0	0
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	420	1511	255
EXPOSED CLG	1.3	0.6	365	468	214	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	79	217	99	0	0	0	0	0	0	0	0	0		0	0	0	156	429	196	0	0	0			0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	444	1132	191	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0				0			0			0								2410	
SLAB ON GRADE HEAT LOSS				0			0			0			0				0			0			0					533			4554	
SUBTOTAL HT LOSS				5450			1701			5460			1078				589			4464			1906					3994				
SUB TOTAL HT GAIN					3205			1011			5020			578				99			2961			433					4076			462
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.30	0.50		0.30	0.50		0.30	0.50			0.30	0.50		0.30	0.50		0.30	0.50							0.50	1.49	
AIR CHANGE HEAT LOSS				2002			857			2751			543				297			2249			969								12761	
AIR CHANGE HEAT GAIN					277			87			433			50				9			256			37								392
DUCT LOSS				745			0			0			0				0			0			0								0	
DUCT GAIN					410			0			0			0				0			0			0								0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0		0		0	0		0	0		0			0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					615			615			615			615				0			0			615					0			615
TOTAL HT LOSS BTU/H				8197			2558			8211			1621				886			6713			2866					4526			17315	
TOTAL HT GAIN x 1.3 BTU/H					5857			2227			7889			1616				140			4181			1410					5299			1909

TOTAL HEAT GAIN BTU/H: 42995 TONS: 3.58 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 64439 TOTAL COMBINED HEAT LOSS BTU/H: 67620

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

INDIVIDUAL BCIN: 15669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARKHOMES

WOB
TYPE: 4003 THE BROOKSIDE DATE: Oct-18 GFA: 3296 LO# 80232

HEATING CFM	1525	COOLING CFM	1525
TOTAL HEAT LOSS	64,439	TOTAL HEAT GAIN	42,460
AIR FLOW RATE CFM	23.67	AIR FLOW RATE CFM	35.92

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	10	6
R/A	0	0	5	2	1

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

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

^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 #	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	21	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	MEDIA	MEDIA	MBR	ENS-2	DIN	KT/GR	KT/GR	KT/GR	MUD	W/R	FOY	MEDIA	STDY	FOY	KT/GR
RM LOSS MBH.	1.56	2.26	0.40	1.52	1.59	1.35	0.56	2.73	2.73	1.56	0.74	2.56	2.05	2.05	2.05	2.87	0.89	3.36	2.73	1.82	3.36	2.05
CFM PER RUN HEAT	37	53	9	36	38	32	13	65	65	37	18	61	49	49	49	68	21	79	65	38	79	49
RM GAIN MBH.	1.97	1.66	0.11	1.80	2.03	1.94	0.15	1.95	1.95	1.97	0.30	2.23	1.97	1.97	1.97	1.41	0.14	2.09	1.95	1.52	2.09	1.97
CFM PER RUN COOLING	71	60	4	65	73	70	5	70	70	71	11	80	71	71	71	51	5	75	70	58	75	71
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	46	55	27	27	47	45	54	56	61	51	27	31	43	36	33	21	29	53	71	11	53	30
EQUIVALENT LENGTH	150	140	130	150	120	160	150	175	185	140	260	140	170	160	100	250	120	110	170	130	120	110
TOTAL EFFECTIVE LENGTH	196	195	157	177	167	205	204	231	246	191	287	171	213	196	133	271	149	163	241	141	173	140
ADJUSTED PRESSURE	0.09	0.09	0.11	0.1	0.1	0.08	0.08	0.07	0.07	0.09	0.06	0.1	0.08	0.09	0.13	0.06	0.12	0.11	0.07	0.12	0.1	0.12
ROUND DUCT SIZE	5	5	4	5	5	5	4	5	5	5	4	5	5	5	5	6	4	5	5	4	5	5
HEATING VELOCITY (ft/min)	272	389	103	264	279	235	149	477	477	272	207	448	360	360	360	347	241	580	477	436	580	360
COOLING VELOCITY (ft/min)	521	441	46	477	536	514	57	514	514	521	126	587	521	521	521	260	57	551	514	665	551	521
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	B	B	B	D	B	D	C	C	A	B	B	A	A	A	B	D	C	C	B	C	A

RUN #	25	26	27	28	29	30
ROOM NAME	BAS	BAS	BAS	BAS	BAS	BAS
RM LOSS MBH.	3.64	3.64	3.64	3.64	3.64	3.64
CFM PER RUN HEAT	86	86	86	86	86	86
RM GAIN MBH.	1.20	1.20	1.20	1.20	1.20	1.20
CFM PER RUN COOLING	43	43	43	43	43	43
ADJUSTED PRESSURE	0.16	0.16	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	39	53	23	35	44	58
EQUIVALENT LENGTH	150	180	150	140	110	200
TOTAL EFFECTIVE LENGTH	189	233	173	175	154	258
ADJUSTED PRESSURE	0.09	0.07	0.09	0.09	0.11	0.06
ROUND DUCT SIZE	5	6	5	5	5	6
HEATING VELOCITY (ft/min)	631	438	631	631	631	438
COOLING VELOCITY (ft/min)	316	219	316	316	316	219
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	A	A	B	D	C	A

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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	528	0.06	11.9	16	x	8	594	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	929	0.06	14.7	26	x	8	643	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	439	0.07	10.7	14	x	8	564	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	597	0.07	12.2	18	x	8	597	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1526	0.06	17.7	28	x	10	785	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	860	0.06	14.2	24	x	8	645
TRUNK Z	335	0.06	10	12	x	8	503
DROP	1525	0.06	17.7	24	x	14	654

RETURN AIR #	1	2	3	4	5	6	7									BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	85	125	155	155	180	390	190	0	0	0	0	0	0	0	0	245
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.	41	53	45	67	71	26	25	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	195	190	185	190	185	145	145	0	0	0	0	0	0	0	0	185
TOTAL EFFECTIVE LH	236	243	230	257	256	171	170	1	1	1	1	1	1	1	1	199
ADJUSTED PRESSURE	0.06	0.06	0.05	0.06	0.06	0.09	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.07
ROUND DUCT SIZE	6	6.9	7.5	7.5	7.9	9.6	7.3	0	0	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	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	30	30	14	0	0	0	0	0	0	0	0	30

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

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

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TYPE: 4003 THE BROOKSIDE
SITE NAME: PINE VALLEY & TESTON

LO # 80232
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	5	@ 10.6 cfm	53	cfm
Other Rooms	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A.		TOTAL	190.8	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	190.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	35.8	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	0.35

SUPPLEMENTAL FANS

NUTONE

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

HEAT RECOVERY VENTILATOR — 9.32.3.11.

Model: 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 PARKHOMES

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 # 001620
Date: October-18

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

INDIVIDUAL BCIN: 19569 MICHAEL O'ROURKE

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 80232 | Model: 4003 THE BROOKSIDE | Builder: GOLD PARKHOMES | Date: 10/5/2018

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1530	9	13923
First	1530	11	16830
Second	1782	9	16216.2
Third	0	9	0
Fourth	0	9	0
		Total:	46,969.2 ft³
		Total:	1330.0 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.400
SUMMER NATURAL AIR CHANGE RATE	0.134

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.400 x 369.45 x 42 °C x 1.2 = 7480 W

= 25521 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.134 x 369.45 x 7 °C x 1.2 = 423 W

= 1443 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 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_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	25,521	8,547	1.493
2	0.3		15,199	0.504
3	0.2		13,894	0.367
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:	4003 THE BROOKSIDE		WOB	BUILDER:	GOLD PARKHOMES
SFQT:	3296	LO#	80232	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):	46969.2	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:	6.1 ft
LENGTH: 59.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	140.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	42.0 ft

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2012 OBC - COMPLIANCE PACKAGE	Compliance Package A1	
Component	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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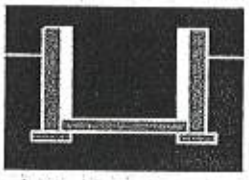
Residential Foundation Thermal Load Calculator

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
Floor Width (m):	9.8
Exposed Perimeter (m):	42.7
Wall Height (m):	2.8
Depth Below Grade (m):	1.56
Window Area (m^2):	0.6
Door Area (m^2):	1.9



Insulation Configuration

Radiant Slab	
Heated Fraction of the Slab:	0
Fluid Temperature (°C):	33
Design Months	
Heating Month	1
Foundation Loads	
Heating Load (Watts):	**706**

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TYPE: 4003 THE BROOKSIDE WOB
LO# 80232

HVAC Designs Ltd.
375 Finley Ave, Suite 202
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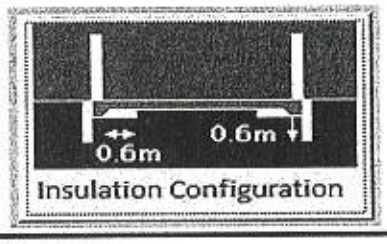
Residential Foundation Thermal Load Calculator

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		
Length (m):	1.5	
Width (m):	9.8	
Exposed Perimeter (m):	12.8	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	**156**	

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TYPE: 4003 THE BROOKSIDE WOB
LO# 80232

HVAC Designs Ltd.
375 Finley Ave, Suite 202
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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):	8.90	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1330.0	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1773.0 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):	**0.400**	
Cooling Air Leakage Rate (ACH/H):	**0.134**	

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TYPE: 4003 THE BROOKSIDE WOB
LO# 80232