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

Block 121 Units 1 to 6

SITE NAME: BARLASSINA | WOB | DATE: Dec-22 | WINTER NATURAL AIR CHANGE RATE 0.376 | HEAT LOSS ΔT °F. 72 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: CHERRY 3E | GFA: 2140 | LO# 99794 | SUMMER NATURAL AIR CHANGE RATE 0.100 | HEAT GAIN ΔT °F. 9 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS				BED-2			BED-3			FLEX			BATH		
EXP. WALL			37			8				10			30			13			10		
CLG. HT.			9			9				9			9			9			9		
	FACTORS																				
GRS.WALL AREA	LOSS	GAIN	333			72				90			270			117			90		
GLAZING			LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	20.3	15.0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
EAST	20.3	40.5	0	0	0	0	0	0		27	547	1095	24	487	973	0	0	0	0	0	0
SOUTH	20.3	23.9	0	0	0	0	0	0		0	0	0	0	0	0	18	365	430	7	142	167
WEST	20.3	40.5	18	365	730	16	324	649		0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	35.5	99.8	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
DOORS	19.1	2.4	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.3	0.5	315	1339	170	56	238	30		63	268	34	246	1046	133	99	421	53	83	353	45
NET EXPOSED BSMT WALL ABOVE GR	3.4	0.4	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.2	0.5	348	425	183	136	166	72		206	252	109	160	196	84	252	308	133	80	98	42
NO ATTIC EXPOSED CLG	2.6	1.1	0	0	0	0	0	0		0	0	0	13	34	15	0	0	0	0	0	0
EXPOSED FLOOR	2.4	0.3	0	0	0	0	0	0		206	500	64	32	78	10	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0				0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0				0			0			0			0	
SUBTOTAL HT LOSS				2130			729				1568			1840			1094			593	
SUB TOTAL HT GAIN					1083			751				1301			1215			616			254
LEVEL FACTOR / MULTIPLIER			0.20	0.35		0.20	0.35			0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35	
AIR CHANGE HEAT LOSS				753			258				554			651			387			210	
AIR CHANGE HEAT GAIN					59			41				71			66			34			14
DUCT LOSS				0			0				212			249			0			0	
DUCT GAIN					0			0				239			230			0			0
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					780			0				780			780			780			0
TOTAL HT LOSS BTU/H				2883			986				2334			2740			1481			802	
TOTAL HT GAIN x 1.3 BTU/H					3124			1029				3421			3291			1859			349

ROOM USE			K/L/D			LAUN			PWD			FOY			MUD			WOB			BAS		
EXP. WALL			61			0			8			48			11			30			125		
CLG. HT.			10			9			10			10			10			9			9		
	FACTORS																						
GRS.WALL AREA	LOSS	GAIN	610			0			80			480			110			270			750		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	20.3	15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	20.3	40.5	0	0	0	0	0	0	0	0	0	11	223	446	0	0	0	0	0	0	0	0	0
SOUTH	20.3	23.9	50	1014	1195	0	0	0	7	142	167	0	0	0	0	0	0	0	0	0	8	162	191
WEST	20.3	40.5	48	973	1946	0	0	0	0	0	0	0	0	0	0	0	0	33	669	1338	0	0	0
SKYLT.	35.5	99.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	19.1	2.4	10	191	24	0	0	0	0	0	0	14	267	34	20	382	49	10	191	24	20	382	49
NET EXPOSED WALL	4.3	0.5	502	2134	271	0	0	0	73	310	39	455	1934	246	90	383	49	227	965	123	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	375	1286	163
EXPOSED CLG	1.2	0.5	0	0	0	48	59	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.6	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.4	0.3	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						1681	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			300				
SUBTOTAL HT LOSS				4312			59			452			2425			765			2125			3511	
SUB TOTAL HT GAIN					3436			25			207			726			97			1485			403
LEVEL FACTOR / MULTIPLIER			0.30	0.53		0.20	0.35		0.30	0.53		0.30	0.53		0.30	0.53					0.50	1.26	
AIR CHANGE HEAT LOSS				2304			21			242			1296			409						7084	
AIR CHANGE HEAT GAIN					188			1			11			40			5						103
DUCT LOSS				0			0			0			0			0						0	
DUCT GAIN					0			0			0			0			0						0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					780			780			0			0			0			0			780
TOTAL HT LOSS BTU/H				6616			79			694			3721			1173			2125			10595	
TOTAL HT GAIN x 1.3 BTU/H					5726			1049			283			995			133			1930			1673

TOTAL HEAT GAIN BTU/H: 25020 TONS: 2.09 LOSS DUE TO VENTILATION LOAD BTU/H: 1243 STRUCTURAL HEAT LOSS: 36230 TOTAL COMBINED HEAT LOSS BTU/H: 37473

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.

NOT THE GRANTING OF A PERMIT NOR REVIEWING OF SPECS & DRAWINGS NOR INSPECTIONS MADE DURING INSTALLATION BY THE OFFICIAL HAVING JURISDICTION SHALL RELIEVE THE OWNER FROM REQUIREMENTS OF THE ONTARIO BUILDING CODE AND ANY OTHER REFERENCED REQUIREMENTS.

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SITE NAME: BARLASSINA
BUILDER: GREENPARK HOMES
WOB
TYPE: CHERRY 3E
DATE: Dec-22
GFA: 2140 LO# 99794

HEATING CFM	890	COOLING CFM	890	furnace pressure	0.6
TOTAL HEAT LOSS	36,230	TOTAL HEAT GAIN	24,862	furnace filter	0.05
AIR FLOW RATE CFM	24.57	AIR FLOW RATE CFM	35.8	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.35

#GOODMAN
GMEC960402BNA **40**
AFUE = 96 %
INPUT (BTU/H) = 40,000
OUTPUT (BTU/H) = **38,400**

FAN SPEED	
LOW	
MEDLOW	
MEDIUM	695
MEDIUM HIGH	
HIGH	890

DESIGN CFM = **890**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 40 °F

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

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

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		BED-2	BED-3	FLEX	BATH	BED-2	BED-3	MBR			K/L/D	K/L/D	K/L/D		LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.44	0.99		1.17	1.37	1.48	0.80	1.17	1.37	1.44			2.21	2.21	2.21		0.08	0.69	3.72	1.17	3.18	3.18	3.18	3.18
CFM PER RUN HEAT	35	24		29	34	36	20	29	34	35			54	54	54		2	17	91	29	78	78	78	78
RM GAIN MBH.	1.56	1.03		1.71	1.65	1.86	0.35	1.71	1.65	1.56			1.91	1.91	1.91		1.05	0.28	1.00	0.13	0.90	0.90	0.90	0.90
CFM PER RUN COOLING	56	37		61	59	67	12	61	59	56			68	68	68		38	10	36	5	32	32	32	32
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	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	48	38		58	60	48	40	59	62	46			23	16	35		35	35	49	39	47	11	40	36
EQUIVALENT LENGTH	170	160		140	170	170	120	150	180	150			140	110	100		140	90	130	140	140	100	140	100
TOTAL EFFECTIVE LENGTH	218	198		198	230	218	160	209	242	196			163	126	135		175	125	179	179	187	111	180	136
ADJUSTED PRESSURE	0.08	0.09		0.09	0.07	0.08	0.11	0.08	0.07	0.09			0.11	0.14	0.13		0.1	0.14	0.09	0.1	0.09	0.15	0.1	0.13
ROUND DUCT SIZE	5	4		5	5	5	4	5	5	5			5	5	5		4	4	**6**	4	5	5	5	5
HEATING VELOCITY (ft/min)	257	275		213	250	264	229	213	250	257			396	396	396		23	195	464	333	573	573	573	573
COOLING VELOCITY (ft/min)	411	424		448	433	492	138	448	433	411			499	499	499		436	115	184	57	235	235	235	235
OUTLET GRILL SIZE	3X10	3X10		3X10	3X10	3X10	3X10	3X10	3X10	3X10			3X10	3X10	3X10		3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	A		D	C	D	D	D	C	B			D	B	A		B	D	C	D	A	B	C	A

RUN #	
ROOM NAME	
RM LOSS MBH.	
CFM PER RUN HEAT	
RM GAIN MBH.	
CFM PER RUN COOLING	
ADJUSTED PRESSURE	
ACTUAL DUCT LGH.	
EQUIVALENT LENGTH	
TOTAL EFFECTIVE LENGTH	
ADJUSTED PRESSURE	
ROUND DUCT SIZE	
HEATING VELOCITY (ft/min)	
COOLING VELOCITY (ft/min)	
OUTLET GRILL SIZE	
TRUNK	

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	x		VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	x		VELOCITY (ft/min)
TRUNK A	269	0.08	8.6	8	x	8	605	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	438	0.08	10.3	12	x	8	657	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	237	0.07	8.5	8	x	8	533	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	451	0.07	10.8	14	x	8	580	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	0	0.00	0	0	x	8	0	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	x		VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	890	0.05	15.1	26	x	8	616
TRUNK Y	734	0.05	14.1	24	x	8	551
TRUNK Z	180	0.05	8.3	8	x	8	405
DROP	890	0.05	15.1	24	x	10	534

RETURN AIR #	1	2	3	4	5											**BR**
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	85	85	85	95	384	0	0	0	0	0	0	0	0	0	0	156
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.	82	75	66	70	41	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	225	235	195	150	185	0	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	307	310	261	220	226	1	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.05	0.05	0.06	0.07	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6.3	6.3	6	6	10.1	0	0	0	0	0	0	0	0	0	0	6.6
INLET GRILL SIZE	8	8	8	8	8	0	0	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	0	0	0	0	0	0	0	0	0	0	14

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Michael O'Rourke (signature) INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: CHERRY 3E LO # 99794
SITE NAME: BARLASSINA 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	2	@ 10.6 cfm	21.2	cfm
Kitchen & Bathrooms	4	@ 10.6 cfm	42.4	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	159.0	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	**63.6**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY — 9.32.3.5.

Total Ventilation Capacity	159	cfm
Less Principal Ventil. Capacity	63.6	cfm
Required Supplemental Capacity	95.4	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE V150H Location: BSMT

63.6 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
63.6 CFM	X	72 F	X	1.08	X	0.25

SUPPLEMENTAL FANS — BY INSTALLING CONTRACTOR

Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	✓	3.5
BATH	BY INSTALLING CONTRACTOR	50	✓	3.5
LAUN	BY INSTALLING CONTRACTOR	50	✓	3.5
PWD	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR — 9.32.3.11.

Model: VANEE V150H

150 cfm high 35 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: GREENPARK 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: December-22

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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 99794 Model: CHERRY 3E Builder: GREENPARK HOMES Date: 12/22/2022

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	981	9	8829
First	981	10	9810
Second	1159	9	10431
Third	0	9	0
Fourth	0	9	0
		Total:	29,070.0 ft³
		Total:	823.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.376
SUMMER NATURAL AIR CHANGE RATE	0.100

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-18	40	72
Summer DTDc	24	29	5	9

5.2.3.1 Heat Loss due to Air Leakage

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

0.376 x 228.66 x 40 °C x 1.2 = 4153 W

= **14169 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.100 x 228.66 x 5 °C x 1.2 = 140 W

= **477 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

64 CFM x 72 °F x 1.08 x 0.25 = **1243 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

64 CFM x 9 °F x 1.08 x 0.25 = **158 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	14,169	5,636	1.257
2	0.3		7,954	0.534
3	0.2		8,011	0.354
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

Michael O'Rourke
BCIN# 19669

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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: CHERRY 3E WOB **BUILDER:** GREENPARK HOMES
SFQT: 2140 **LO#** 99794 **SITE:** BARLASSINA

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	0	OUTDOOR DESIGN TEMP.	84
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75
		WINDOW SHGC	0.50

BUILDING DATA

ATTACHMENT:	ATTACHED	# 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):	29070.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.75	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 62.0 ft	WIDTH: 20.0 ft	EXPOSED PERIMETER:	125.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	30.0 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	96%	-
HRV/ERV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

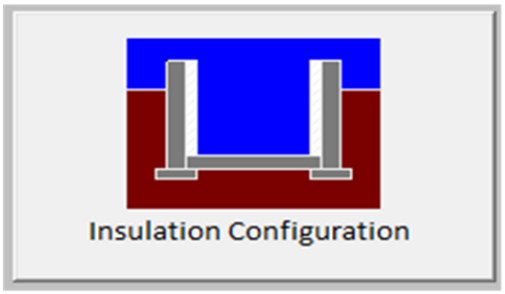
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Cambridge
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):	**6.1**	
Exposed Perimeter (m):	**38.1**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.46**	
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):	**493**	

TYPE: CHERRY 3E WOB
LO# 99794

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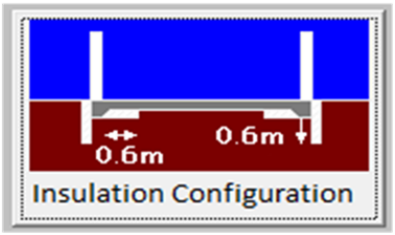
Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Cambridge
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):	**6.1**	
Exposed Perimeter (m):	**9.1**	

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

Results	
Heating Load (Watts):	**88**

TYPE: CHERRY 3E WOB
LO# 99794

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Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Cambridge
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):	8.53
Building Configuration	
Type:	Semi
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	823.2
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1097.3 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 30.0 / Total Exhaust 30.0
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.376**
Cooling Air Leakage Rate (ACH/H):	**0.100**

TYPE: CHERRY 3E WOB

LO# 99794

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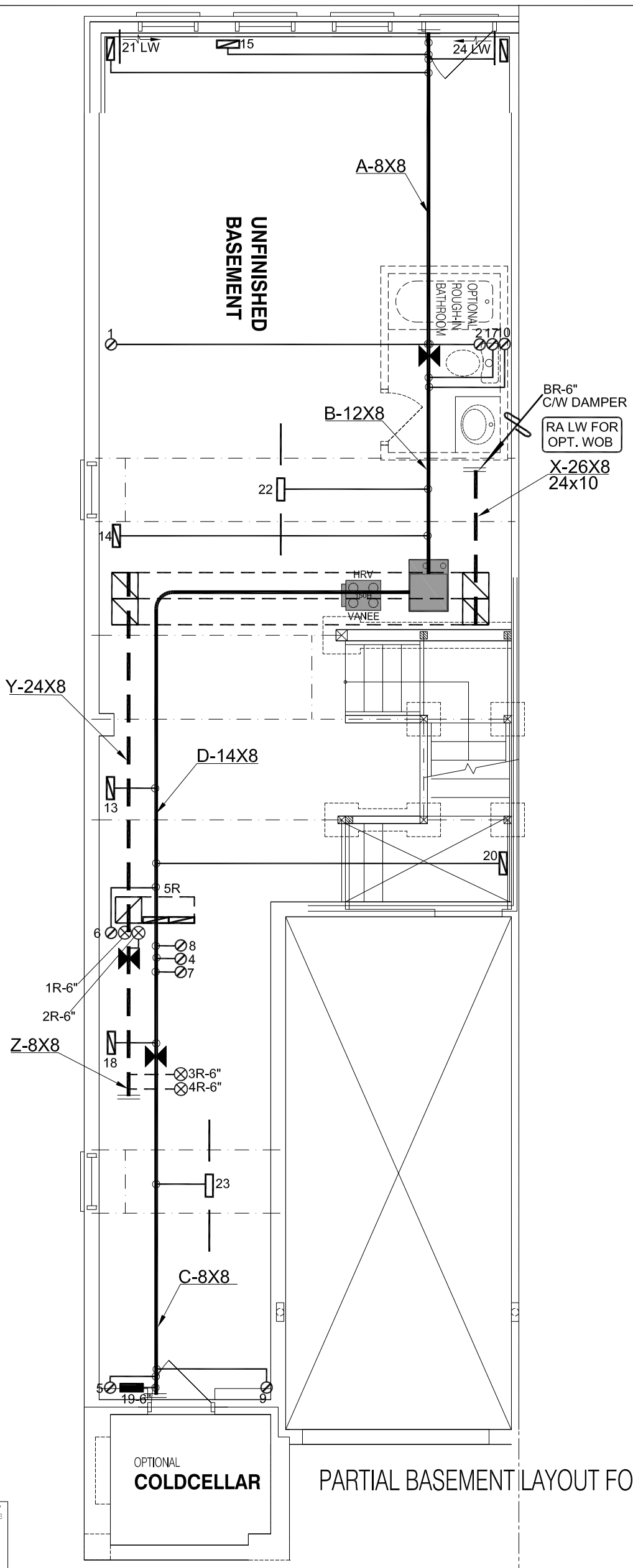

PARTIAL BASEMENT LAYOUT FOR WOB CONDITION

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.

WOB

CSA-F280-12

PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	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

Client
GREENPARK HOMES

Project Name
BARLASSINA
CAMBRIDGE, ONTARIO
Block 121 Units 1 to 6
WOB
CHERRY 3E 2140 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 37473 BTU/H		
UNIT DATA		
MAKE	GOODMAN	
MODEL	GMEC960402BNA	
INPUT	40	MBTU/H
OUTPUT	38.4	MBTU/H
COOLING	2.0	TONS
FAN SPEED	890	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	10	4	3
1ST FLOOR	6	1	2
BASEMENT	4	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 DEC/2022
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 99794

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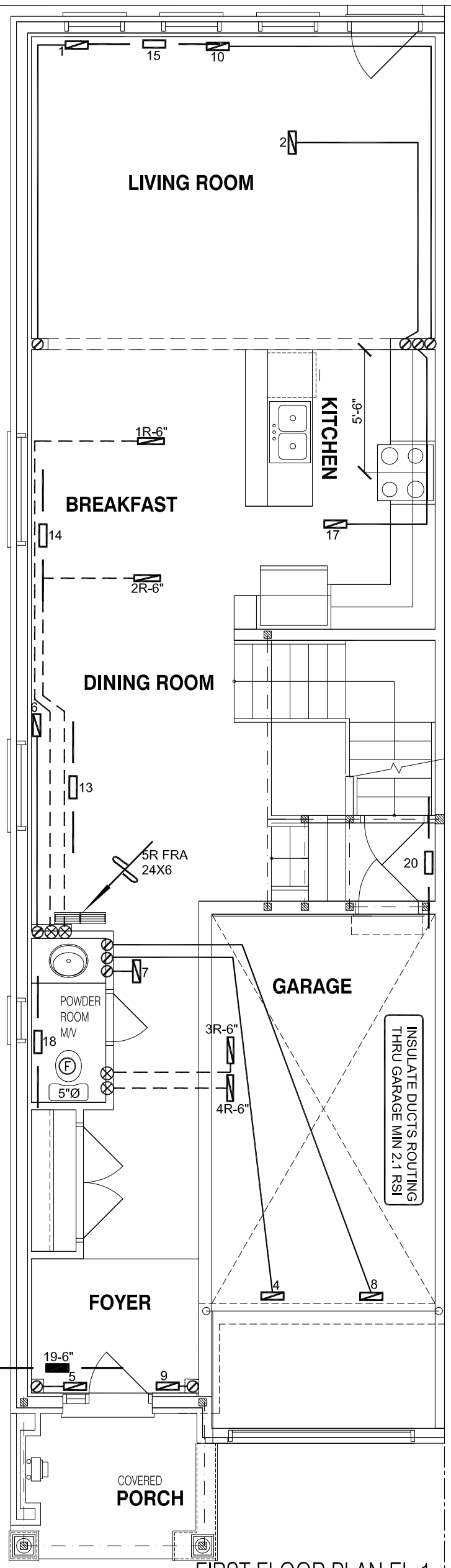

FIRST FLOOR PLAN EL-1

FIRST FLOOR PLAN EL-2

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

WOB
CSA-F280-12
PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▱	14"x8" RETURN AIR GRILLE	▱	RETURN AIR STACK ABOVE
— ▬ —	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

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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 DEC/2022
Scale 3/16" = 1'-0"
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LO# 99794

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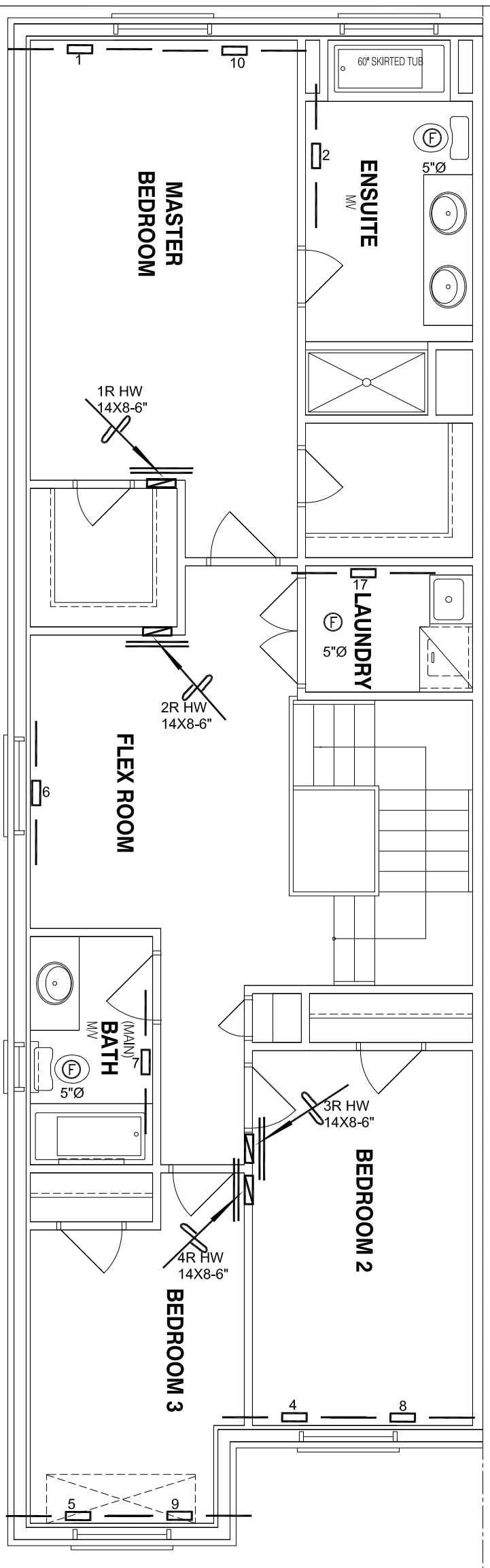
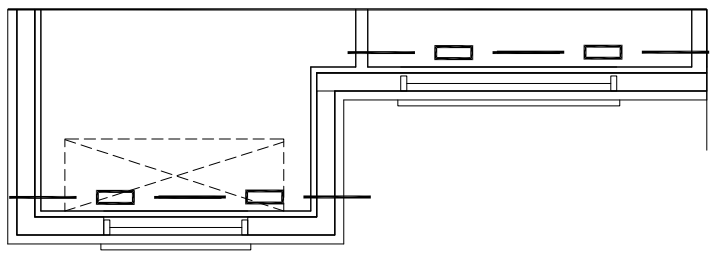


SEC. FLOOR PLAN EL-1



SEC. FLOOR PLAN EL-2

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HVAC DESIGNS LTD.

WOB
CSA-F280-12
PACKAGE A1

HVAC LEGEND

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

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date DEC/2022
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 99794