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 122 Units 43 to 48

SITE NAME: BARLASSINA | DATE: Aug-22 | WINTER NATURAL AIR CHANGE RATE 0.319 | HEAT LOSS ΔT °F. 72 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: WILLOW 2 | GFA: 1795 | LO# 98654 | SUMMER NATURAL AIR CHANGE RATE 0.085 | HEAT GAIN ΔT °F. 9 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			MEDIA			BATH		
EXP. WALL			12			8			0			10			16			0			0		
CLG. HT.			9			9			9			9			9			9			9		
	FACTORS																						
GRS.WALL AREA	LOSS	GAIN	108			72			0			90			144			0			0		
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	23	466	933	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	0	0	0	0	0	0	0	0	0
WEST	20.3	40.5	27	547	1095	16	324	649	0	0	0	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	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	0	0	0
NET EXPOSED WALL	4.3	0.5	81	344	44	56	238	30	0	0	0	67	285	36	120	510	65	0	0	0	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	0	0	0
EXPOSED CLG	1.2	0.5	228	279	120	104	127	55	48	59	25	180	220	95	170	208	90	318	389	168	72	88	38
NO ATTIC EXPOSED CLG	2.6	1.1	0	0	0	0	0	0	0	0	0	12	31	14	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.4	0.3	50	121	15	65	158	20	30	73	9	180	437	56	42	102	13	73	177	23	30	73	9
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				1292			847			132			1440			1307			566			161	
SUB TOTAL HT GAIN					1274			754			35			1133			1140			190			47
LEVEL FACTOR / MULTIPLIER			0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33	
AIR CHANGE HEAT LOSS				429			281			44			478			434			188			53	
AIR CHANGE HEAT GAIN					79			47			2			70			70			12			3
DUCT LOSS				172			113			18			192			174			75			21	
DUCT GAIN					229			80			4			190			191			66			5
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					459			0			0			459			459			459			0
TOTAL HT LOSS BTU/H				1893			1242			193			2110			1914			829			236	
TOTAL HT GAIN x 1.3 BTU/H					3277			1145			52			2719			2731			944			72

ROOM USE			K/L/D			LAUN			PWD			FOY			MUD			BAS		
EXP. WALL			42			0			11			26			17			93		
CLG. HT.			10			9			10			10			10			9		
	FACTORS																			
GRS.WALL AREA	LOSS	GAIN	420			0			110			260			170			558		
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	0	0	0	14	284	568	0	0	0	0	0	0
SOUTH	20.3	23.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST	20.3	40.5	44	892	1784	0	0	0	0	0	0	0	0	0	0	0	0	4	81	162
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	10	191	24	0	0	0	0	0	0	11	210	27	20	382	49	20	382	49
NET EXPOSED WALL	4.3	0.5	366	1556	198	0	0	0	110	468	59	235	999	127	150	638	81	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	279	956	122
EXPOSED CLG	1.2	0.5	0	0	0	42	51	22	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
EXPOSED FLOOR	2.4	0.3	0	0	0	24	58	7	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			2815	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0				
SUBTOTAL HT LOSS				2639			110			468			1493			1020			4235	
SUB TOTAL HT GAIN					2006			30			59			721			130			332
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.20	0.33		0.30	0.52		0.30	0.52		0.30	0.52		0.50	1.15	
AIR CHANGE HEAT LOSS				1369			36			243			775			529			4859	
AIR CHANGE HEAT GAIN					124			2			4			45			8			21
DUCT LOSS				0			15			0			0			0			0	
DUCT GAIN					0			49			0			0			0			0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					459			459			0			0			0			459
TOTAL HT LOSS BTU/H				4008			161			710			2268			1549			9094	
TOTAL HT GAIN x 1.3 BTU/H					3365			701			82			996			179			1055

TOTAL HEAT GAIN BTU/H: 17474 TONS: 1.46 LOSS DUE TO VENTILATION LOAD BTU/H: 1243 STRUCTURAL HEAT LOSS: 26205 TOTAL COMBINED HEAT LOSS BTU/H: 27449

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
TYPE: WILLOW 2
DATE: Aug-22
GFA: 1795
LO# 98654

HEATING CFM	614	COOLING CFM	614	furnace pressure	0.6
TOTAL HEAT LOSS	26,205	TOTAL HEAT GAIN	17,316	furnace filter	0.05
AIR FLOW RATE CFM	23.43	AIR FLOW RATE CFM	35.46	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.35

#GOODMAN
GMEC960302BNA **30**

FAN SPEED	
LOW	
MEDLOW	
MEDIUM	614
MEDIUM HIGH	
HIGH	895

AFUE = 96 %
INPUT (BTU/H) = 30,000
OUTPUT (BTU/H) = **28,800**
DESIGN CFM = **614**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 43 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	11	5	3
R/A	0	0	4	1	1

plenum pressure s/a	0.18	r/a pressure	0.17
max s/a dif press. loss	0.01	r/a grille press. Loss	0.02
min adjusted pressure s/a	0.17	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	14	15	17	18	19	20	21	22	23
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	MEDIA	BATH	BED-2	BED-3	MBR	K/L/D	K/L/D	LAUN	PWD	FOY	MUD	BAS	BAS	BAS
RM LOSS MBH.	0.95	1.24	0.19	1.05	0.96	0.83	0.24	1.05	0.96	0.95	2.00	2.00	0.16	0.71	2.27	1.55	3.03	3.03	3.03
CFM PER RUN HEAT	22	29	5	25	22	19	6	25	22	22	47	47	4	17	53	36	71	71	71
RM GAIN MBH.	1.64	1.14	0.05	1.36	1.37	0.94	0.07	1.36	1.37	1.64	1.68	1.68	0.70	0.08	1.00	0.18	0.35	0.35	0.35
CFM PER RUN COOLING	58	41	2	48	48	33	3	48	48	58	60	60	25	3	35	6	12	12	12
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
ACTUAL DUCT LGH.	42	35	23	59	51	29	20	55	56	40	26	28	18	29	41	23	28	14	27
EQUIVALENT LENGTH	200	170	200	170	150	130	170	180	170	190	100	90	150	100	130	130	90	140	90
TOTAL EFFECTIVE LENGTH	242	205	223	229	201	159	190	235	226	230	126	118	168	129	171	153	118	154	117
ADJUSTED PRESSURE	0.07	0.08	0.08	0.08	0.09	0.11	0.09	0.07	0.08	0.07	0.14	0.15	0.1	0.13	0.1	0.11	0.15	0.11	0.15
ROUND DUCT SIZE	5	4	4	5	5	5	4	5	5	5	5	5	4	4	5	4	5	5	5
HEATING VELOCITY (ft/min)	162	333	57	184	162	140	69	184	162	162	345	345	46	195	389	413	521	521	521
COOLING VELOCITY (ft/min)	426	470	23	352	352	242	34	352	352	426	441	441	287	34	257	69	88	88	88
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	C	C	C	A	A	B	B	A	A	C	C	C	B	B	A	B	C	C	B

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			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	147	0.07	7.1	8	x	8	331	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	300	0.07	9.2	12	x	8	450	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	314	0.07	9.4	10	x	8	565	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	0	0.00	0	0	x	8	0	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			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	614	0.05	13.1	20	x	8	553
TRUNK Y	205	0.05	8.7	10	x	8	369
TRUNK Z	0	0.05	0	0	x	8	0
DROP	614	0.05	13.1	24	x	10	368

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	75	65	65	75	250	0	0	0	0	0	0	0	0	0	0	84
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.	44	63	62	62	11	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	215	230	225	185	175	0	0	0	0	0	0	0	0	0	0	220
TOTAL EFFECTIVE LH	259	293	287	247	186	1	1	1	1	1	1	1	1	1	1	234
ADJUSTED PRESSURE	0.06	0.05	0.05	0.06	0.08	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.06
ROUND DUCT SIZE	5.7	5.7	5.7	5.7	8.3	0	0	0	0	0	0	0	0	0	0	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	24	0	0	0	0	0	0	0	0	0	0	14

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INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: WILLOW 2 LO # 98654
SITE NAME: BARLASSINA

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: August-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#: 98654 Model: WILLOW 2 Builder: GREENPARK HOMES Date: 2022-08-30

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	733	9	6597
First	733	10	7330
Second	1062	9	9558
Third	0	9	0
Fourth	0	9	0
		Total:	23,485.0 ft³
		Total:	665.0 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.319
SUMMER NATURAL AIR CHANGE RATE	0.085

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

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

0.319 x 184.73 x 40 °C x 1.2 = 2848 W

= **9717 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.085 x 184.73 x 5 °C x 1.2 = 96 W

= **327 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	9,717	4,235	1.147
2	0.3		5,619	0.519
3	0.2		5,854	0.332
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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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: WILLOW 2 **BUILDER:** GREENPARK HOMES
SFQT: 1795 **LO#** 98654 **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):	23485.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 55.0 ft	WIDTH: 17.0 ft	EXPOSED PERIMETER:	93.0 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

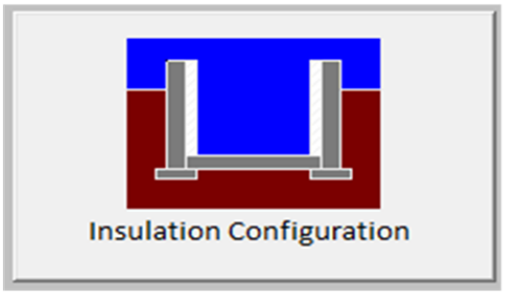
Michael O'Rourke

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):	**16.8**	 Insulation Configuration
Floor Width (m):	**5.2**	
Exposed Perimeter (m):	**28.3**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**0.4**	
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):	**825**	

TYPE: WILLOW 2
LO# 98654

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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:	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):	6.71
Building Configuration	
Type:	Semi
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	665.0
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 886.5 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):	**0.319**
Cooling Air Leakage Rate (ACH/H):	**0.085**

TYPE: WILLOW 2
LO# 98654

Michael O'Rourke BCIN# 19669

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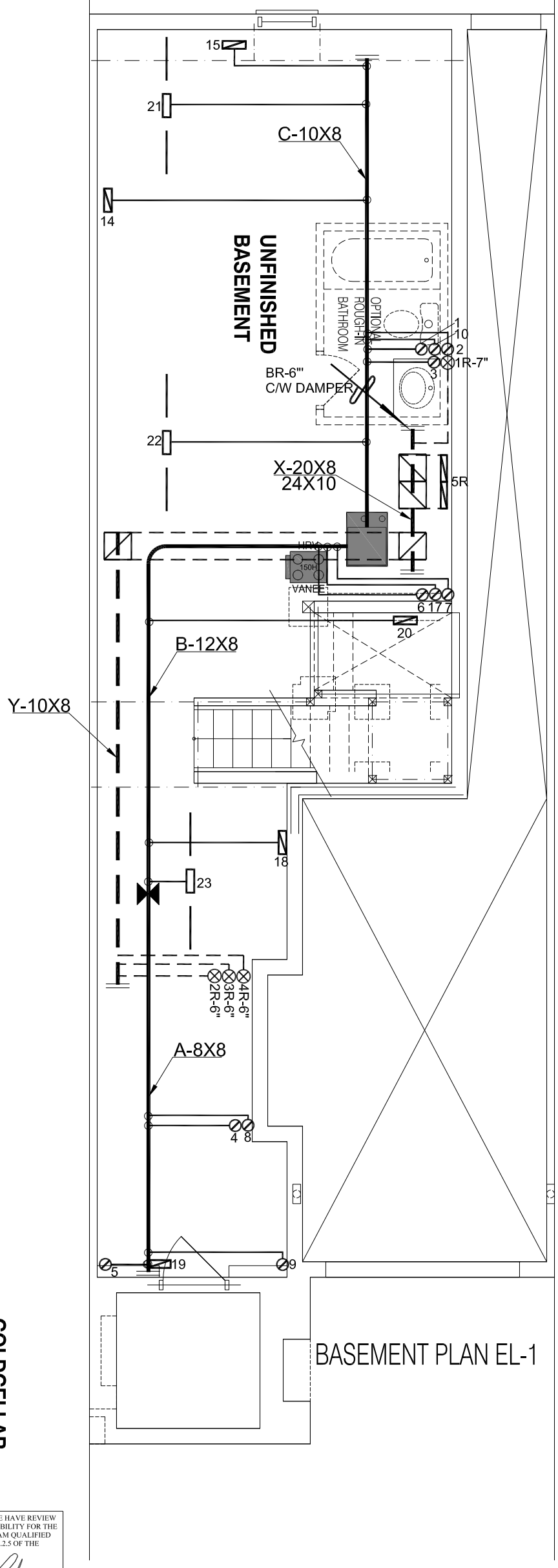

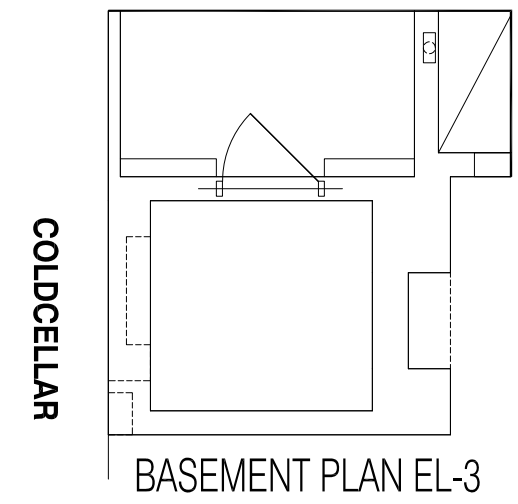

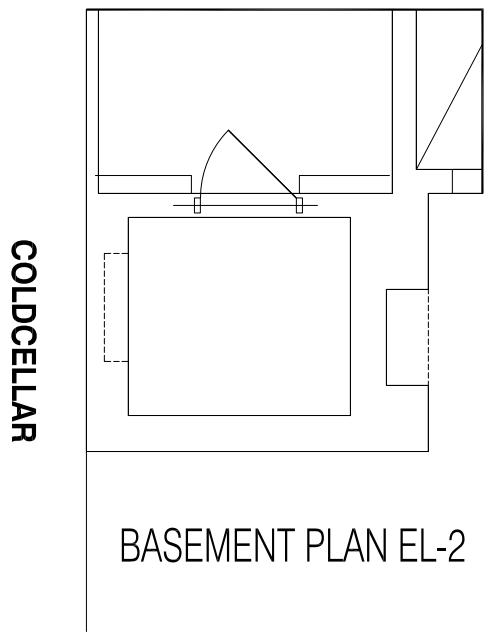

I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

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 122 Units 43 to 48

WILLOW 2 1795 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
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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.

HEAT LOSS 27449 BTU/H		
UNIT DATA		
MAKE	GOODMAN	
MODEL	GMEC960302BNA	
INPUT	30	MBTU/H
OUTPUT	28.8	MBTU/H
COOLING	1.5	TONS
FAN SPEED	614	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	11	4	3
1ST FLOOR	5	1	2
BASEMENT	3	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 /2022

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 98654

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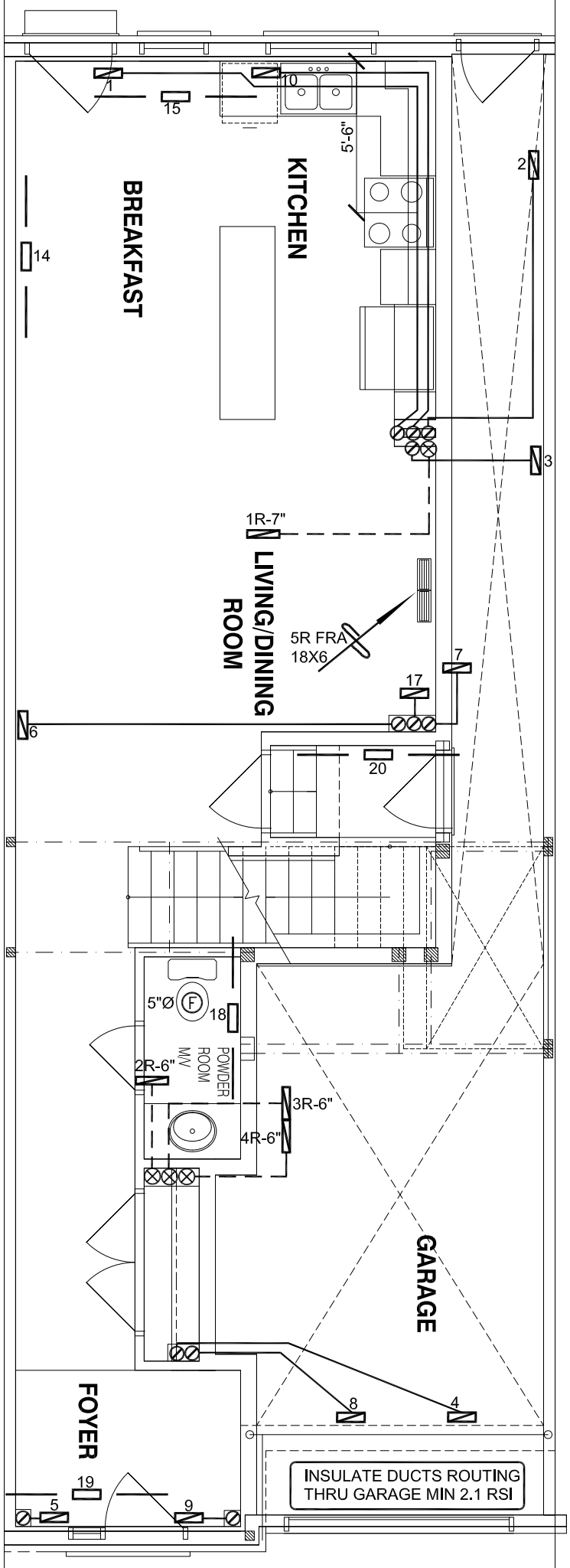
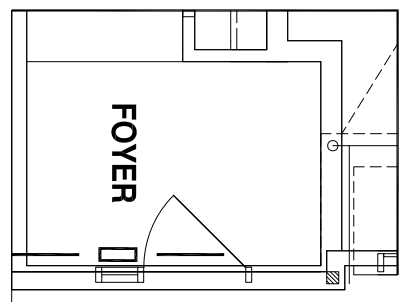
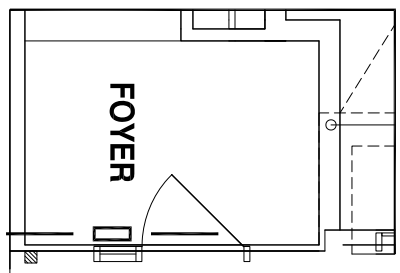


FIRST FLOOR PLAN EL-1



FIRST FLOOR PLAN EL-3



FIRST FLOOR PLAN EL-2

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CSA-F280-12

PACKAGE A1

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Sheet Title
FIRST FLOOR HEATING LAYOUT

Date /2022

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 98654

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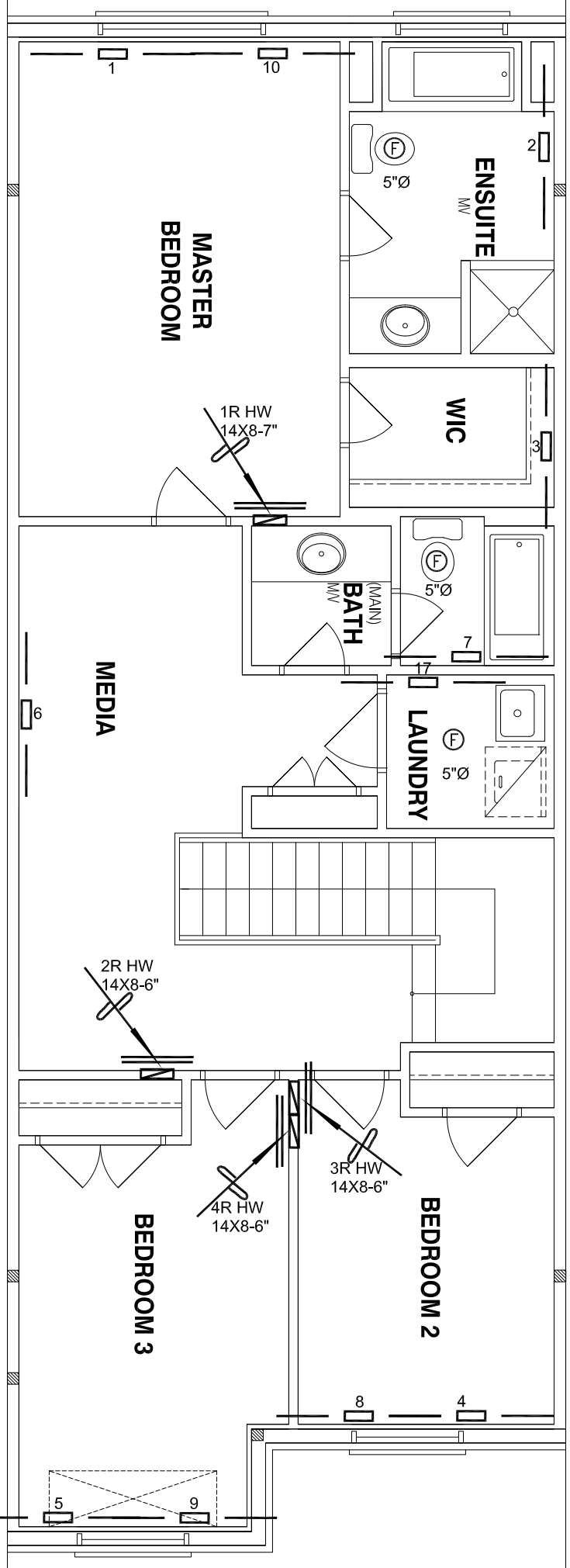
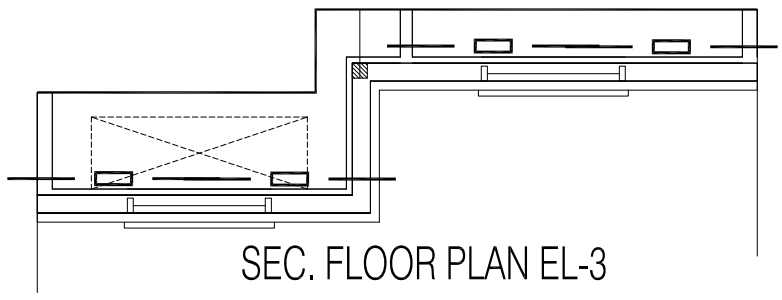
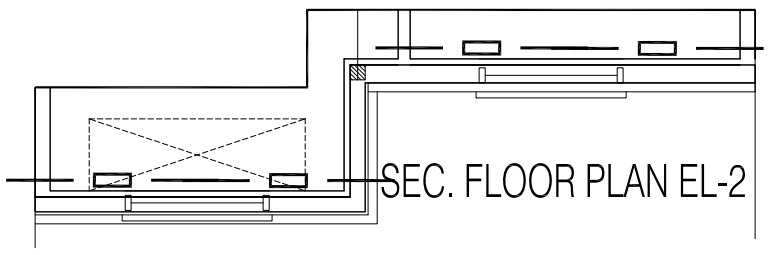




SEC. FLOOR PLAN EL-3



SEC. FLOOR PLAN EL-2

SEC. FLOOR PLAN EL-1

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PACKAGE A1

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date /2022

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 98654