

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.

Block 122 Units 55 to 60

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 3E										GFA: 1775										LO# 98655										SUMMER NATURAL AIR CHANGE RATE 0.085										HEAT GAIN ΔT °F. 9										SB-12 PACKAGE A1									
ROOM USE			MBR			ENS			BED-2			BED-3			BATH			FLEX																																																			
EXP. WALL			34			0			10			30			0			25																																																			
CLG. HT.			9			9			9			9			9			9																																																			
FACTORS																																																																					
GRS.WALL AREA			LOSS			GAIN			306			0			90			270			0			225																																													
GLAZING									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	0	0	0	0	0	0	0	0	0																																			
EAST			20.3	40.5	0	0	0	0	0	0	0	0	23	466	933	24	487	973	0	0	0	0	0	0	0	0	0	0	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	36	730	860	0	0	0	0	0	0																																			
WEST			20.3	40.5	24	487	973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																			
SKYLT.			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	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	0	0	0	0	0	0	0	0	0																																			
NET EXPOSED WALL			4.3	0.5	282	1199	152	0	0	0	0	67	285	36	246	1046	133	0	0	0	189	803	102	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0																																			
EXPOSED CLG			1.2	0.5	280	342	148	110	134	58	189	231	100	148	181	78	81	99	43	250	306	132	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	12	31	14	12	31	14	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	180	437	56	10	24	3	0	0	0	7	17	2	0	0	0	0	0	0	0	0	0	0	0	0																																		
BASEMENT/CRAWL HEAT LOSS						0			0			0			0			0			0			0			0			0			0			0			0																														
SLAB ON GRADE HEAT LOSS						0			0			0			0			0			0			0			0			0			0			0			0																														
SUBTOTAL HT LOSS						2028			134			1451			1769			99			1856																																																
SUB TOTAL HT GAIN						1273			58			1137			1201			43			1096																																																
LEVEL FACTOR / MULTIPLIER			0.20			0.27			0.20			0.27			0.20			0.27			0.20			0.27																																													
AIR CHANGE HEAT LOSS						549			36			393			479			27			502																																																
AIR CHANGE HEAT GAIN						66			3			59			62			2			57																																																
DUCT LOSS						0			0			184			225			0			236																																																
DUCT GAIN						0			0			190			197			0			162																																																
HEAT GAIN PEOPLE			240		2		480	0	0	0	1		240	1		240	0		0		0		0		0		0		0		0		0		0																																		
HEAT GAIN APPLIANCES/LIGHTS						468			0			468			468			0			468																																																
TOTAL HT LOSS BTU/H						2576			171			2028			2473			126			2594																																																
TOTAL HT GAIN x 1.3 BTU/H						2972			79			2723			2817			58			2317																																																

ROOM USE						K/B/L				W/R		FOY		MUD																BAS		
EXP. WALL						47				8		48		11																92		
CLG. HT.						10				10		10		10																9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN				470				80		480		110																552		
GLAZING						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
EAST	20.3	40.5				0	0	0		0	0	0	14	284	568	0	0	0	0											0	0	0
SOUTH	20.3	23.9				22	446	526		7	142	167	0	0	0	0	0	0	0											8	162	191
WEST	20.3	40.5				56	1135	2270		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
DOORS	19.1	2.4				8	153	19		0	0	0	11	210	27	21	401	51												21	401	51
NET EXPOSED WALL	4.3	0.5				384	1633	207		73	310	39	455	1934	246	89	378	48												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											276	946	120
EXPOSED CLG	1.2	0.5				0	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
EXPOSED FLOOR	2.4	0.3				0	0	0		0	0	0	0	0	0	0	0	0	0											0	0	0
BASEMENT/CRAWL HEAT LOSS						0				0		0		0																	2840	
SLAB ON GRADE HEAT LOSS						0				0		0		0																		
SUBTOTAL HT LOSS						3367				452		2428		780																	4431	
SUB TOTAL HT GAIN							3023				207		840		99																525	
LEVEL FACTOR / MULTIPLIER						0.30	0.42			0.30	0.42	0.30	0.42	0.30	0.42															0.50	1.12	
AIR CHANGE HEAT LOSS						1427				192		1029		330																	4964	
AIR CHANGE HEAT GAIN							157				11		44		5																27	
DUCT LOSS						0				0		0		0																	0	
DUCT GAIN							0				0		0		0																0	
HEAT GAIN PEOPLE	240					0	0			0		0	0	0	0	0	0	0												0	0	
HEAT GAIN APPLIANCES/LIGHTS							468				0		0		468																468	
TOTAL HT LOSS BTU/H						4794				644		3458		1110																	9395	
TOTAL HT GAIN x 1.3 BTU/H							4741				283		1149		743																1325	

TOTAL HEAT GAIN BTU/H:

19366

TONS: 1.61

LOSS DUE TO VENTILATION LOAD BTU/H: 1243

STRUCTURAL HEAT LOSS: 29368

TOTAL COMBINED HEAT LOSS BTU/H: 30611



SITE NAME: BARLASSINA

BUILDER: GREENPARK HOMES

TYPE: WILLOW 3E

DATE: Aug-22

GFA: 1775

LO# 98655

HEATING CFM 695 COOLING CFM 695
TOTAL HEAT LOSS 29,368 TOTAL HEAT GAIN 19,208
AIR FLOW RATE CFM 23.67 AIR FLOW RATE CFM 36.18

furnace pressure 0.6
furnace filter 0.05
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

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	9	6	3
R/A	0	0	3	1	1

plenium pressure s/a 0.18
max s/a dif press. loss 0.02
min adjusted pressure s/a 0.16

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

FAN SPEED
LOW
MEDLOW
MEDIUM 695
MEDIUM HIGH
HIGH 890

DESIGN CFM = 695
CFM @ .6" E.S.P.

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

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

RUN #	1	2	3	4	5	6	7	8	10	14	15	16	18	19	20	21	22	23
ROOM NAME	MBR	ENS	BED-2	BED-2	BED-3	BED-3	BATH	FLEX	MBR	K/B/L	K/B/L	K/B/L	W/R	FOY	MUD	BAS	BAS	BAS
RM LOSS MBH.	1.29	0.17	1.01	1.01	1.24	1.24	0.13	2.59	1.29	1.60	1.60	1.60	0.64	3.46	1.11	3.13	3.13	3.13
CFM PER RUN HEAT	30	4	24	24	29	29	3	61	30	38	38	38	15	82	26	74	74	74
RM GAIN MBH.	1.49	0.08	1.36	1.36	1.41	1.41	0.06	2.32	1.49	1.58	1.58	1.58	0.28	1.15	0.74	0.44	0.44	0.44
CFM PER RUN COOLING	54	3	49	49	51	51	2	84	54	57	57	57	10	42	27	16	16	16
ADJUSTED PRESSURE	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	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	54	39	49	52	47	54	60	39	41	22	34	26	35	33	16	31	22	31
EQUIVALENT LENGTH	150	180	150	160	130	190	220	140	190	110	110	110	140	90	190	110	100	150
TOTAL EFFECTIVE LENGTH	204	219	199	212	177	244	280	179	231	132	144	136	175	123	206	141	122	181
ADJUSTED PRESSURE	0.08	0.08	0.09	0.08	0.1	0.07	0.06	0.09	0.07	0.13	0.12	0.13	0.1	0.13	0.08	0.12	0.14	0.1
ROUND DUCT SIZE	5	4	5	5	5	5	4	6	5	5	5	5	4	6	4	5	5	5
HEATING VELOCITY (ft/min)	220	46	176	176	213	213	34	311	220	279	279	279	172	418	298	543	543	543
COOLING VELOCITY (ft/min)	396	34	360	360	374	374	23	428	396	419	419	419	115	214	310	117	117	117
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10
TRUNK	B	A	C	C	C	C	C	B	A	B	A	A	C	C	C	A	B	C

RUN #	1	2	3	4	5	6	7	8	10	14	15	16	18	19	20	21	22	23
ROOM NAME	MBR	ENS	BED-2	BED-2	BED-3	BED-3	BATH	FLEX	MBR	K/B/L	K/B/L	K/B/L	W/R	FOY	MUD	BAS	BAS	BAS
RM LOSS MBH.	1.29	0.17	1.01	1.01	1.24	1.24	0.13	2.59	1.29	1.60	1.60	1.60	0.64	3.46	1.11	3.13	3.13	3.13
CFM PER RUN HEAT	30	4	24	24	29	29	3	61	30	38	38	38	15	82	26	74	74	74
RM GAIN MBH.	1.49	0.08	1.36	1.36	1.41	1.41	0.06	2.32	1.49	1.58	1.58	1.58	0.28	1.15	0.74	0.44	0.44	0.44
CFM PER RUN COOLING	54	3	49	49	51	51	2	84	54	57	57	57	10	42	27	16	16	16
ADJUSTED PRESSURE	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	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	54	39	49	52	47	54	60	39	41	22	34	26	35	33	16	31	22	31
EQUIVALENT LENGTH	150	180	150	160	130	190	220	140	190	110	110	110	140	90	190	110	100	150
TOTAL EFFECTIVE LENGTH	204	219	199	212	177	244	280	179	231	132	144	136	175	123	206	141	122	181
ADJUSTED PRESSURE	0.08	0.08	0.09	0.08	0.1	0.07	0.06	0.09	0.07	0.13	0.12	0.13	0.1	0.13	0.08	0.12	0.14	0.1
ROUND DUCT SIZE	5	4	5	5	5	5	4	6	5	5	5	5	4	6	4	5	5	5
HEATING VELOCITY (ft/min)	220	46	176	176	213	213	34	311	220	279	279	279	172	418	298	543	543	543
COOLING VELOCITY (ft/min)	396	34	360	360	374	374	23	428	396	419	419	419	115	214	310	117	117	117
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10
TRUNK	B	A	C	C	C	C	C	B	A	B	A	A	C	C	C	A	B	C

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	184	0.07	7.7	8	x 8 414	TRUNK G	0	0.00	0	0 x 8 0
TRUNK B	387	0.07	10.2	12	x 8 581	TRUNK H	0	0.00	0	0 x 8 0
TRUNK C	306	0.06	9.7	12	x 8 459	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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.07	0	0	x 8 0	TRUNK X	695	0.07	12.7	18 x 8 695
TRUNK P	0	0.07	0	0	x 8 0	TRUNK Y	220	0.07	8.2	8 x 8 495
TRUNK Q	0	0.07	0	0	x 8 0	TRUNK Z	0	0.07	0	0 x 8 0
TRUNK R	0	0.07	0	0	x 8 0	DROP	695	0.07	12.7	24 x 10 417
TRUNK S	0	0.07	0	0	x 8 0					
TRUNK T	0	0.07	0	0	x 8 0					
TRUNK U	0	0.07	0	0	x 8 0					
TRUNK V	0	0.07	0	0	x 8 0					
TRUNK W	0	0.07	0	0	x 8 0					

RETURN AIR #	1	2	3	5	6	7	8	10	14	15	16	18	19	20	21	22	23
AIR VOLUME	110	110	100	300	0	0	0	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	59	57	62	1	18	1	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	150	145	135	0	140	0	0	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	209	202	197	1	158	1	1	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.07	0.07	0.08	14.80	0.09	14.80	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	5.9	0	8.7	0	0	0	0	0	0	0	0	0	0	0	5
INLET GRILL SIZE	8	8	8	0	8	0	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	X
INLET GRILL SIZE	14	14	14	0	30	0	0	0	0	0	0	0	0	0	0	0	14

TYPE: WILLOW 3E
SITE NAME: BARLASSINA

LO # 98655

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>2</u> @ 10.6 cfm	<u>21.2</u> cfm
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Other Rooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Table 9.32.3.A.	TOTAL	<u>148.4</u> cfm

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>148.4</u>	cfm
Less Principal Ventil. Capacity	<u>63.6</u>	cfm
Required Supplemental Capacity	<u>84.8</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE V150H	Location: BSMT
<u>63.6</u> 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
W/R	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE V150H		
<u>150</u> cfm high	<u>35</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER: 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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	August-22

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 98655	Model: WILLOW 3E	Builder: GREENPARK HOMES	Date: 2022-08-31																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>802</td> <td>9</td> <td>7218</td> </tr> <tr> <td>First</td> <td>802</td> <td>10</td> <td>8020</td> </tr> <tr> <td>Second</td> <td>973</td> <td>9</td> <td>8757</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>23,995.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>679.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	802	9	7218	First	802	10	8020	Second	973	9	8757	Third	0	9	0	Fourth	0	9	0	Total:			23,995.0 ft³	Total:			679.5 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">0.319</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.085</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td>22</td> <td>-18</td> <td>40</td> <td>72</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>29</td> <td>5</td> <td>9</td> </tr> </table>		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
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.319 x 188.74 x 40 °C x 1.2 = 2910 W = 9928 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.085 x 188.74 x 5 °C x 1.2 = 98 W = 334 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to 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			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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	9,928	4,431	1.120																																																								
2	0.3		7,027	0.424																																																								
3	0.2		7,337	0.271																																																								
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 																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: WILLOW 3E	BUILDER: GREENPARK HOMES
SFQT: 1775	SITE: BARLASSINA
LO# 98655	

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):	23995.0	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: 52.0 ft	WIDTH: 20.0 ft	EXPOSED PERIMETER:	92.0 ft

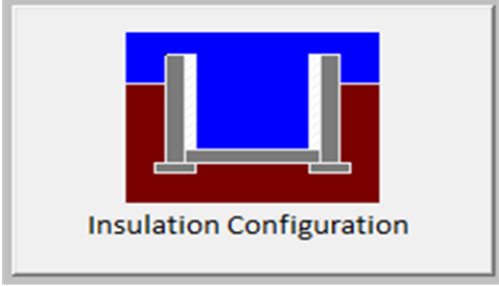
2012 OBC - COMPLIANCE PACKAGE		Compliance Package A1	
Component	NOT THE GRANTING OF A PERMIT NOR REVIEWING OF SPECS & DRAWINGS NOR INSPECTIONS MADE DURING INSTALLATION BY THE OFFICIAL HAVING JURISDICTION SHALL RELIEVE THE OWNER FROM REQUIREMENTS OF THE ONTARIO BUILDING CODE AND ANY OTHER REFERENCED REQUIREMENTS.	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



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):	15.8	 Insulation Configuration
Floor Width (m):	6.1	
Exposed Perimeter (m):	28.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.1	
Door Area (m ²):	2.0	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		832

TYPE: WILLOW 3E
LO# 98655

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.

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

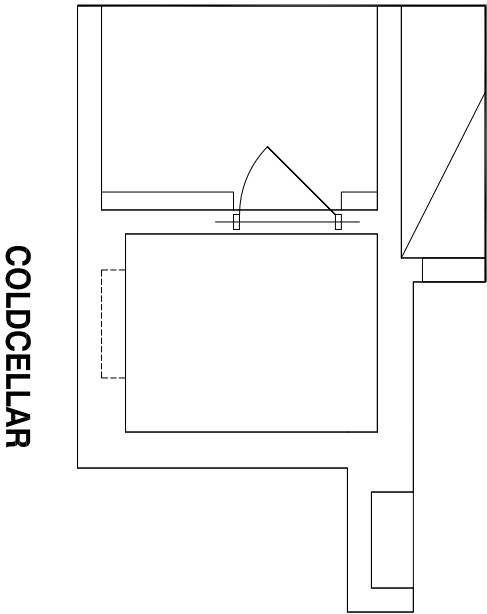
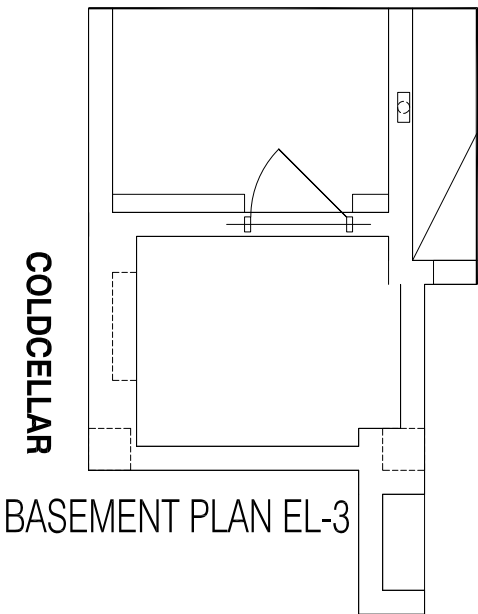
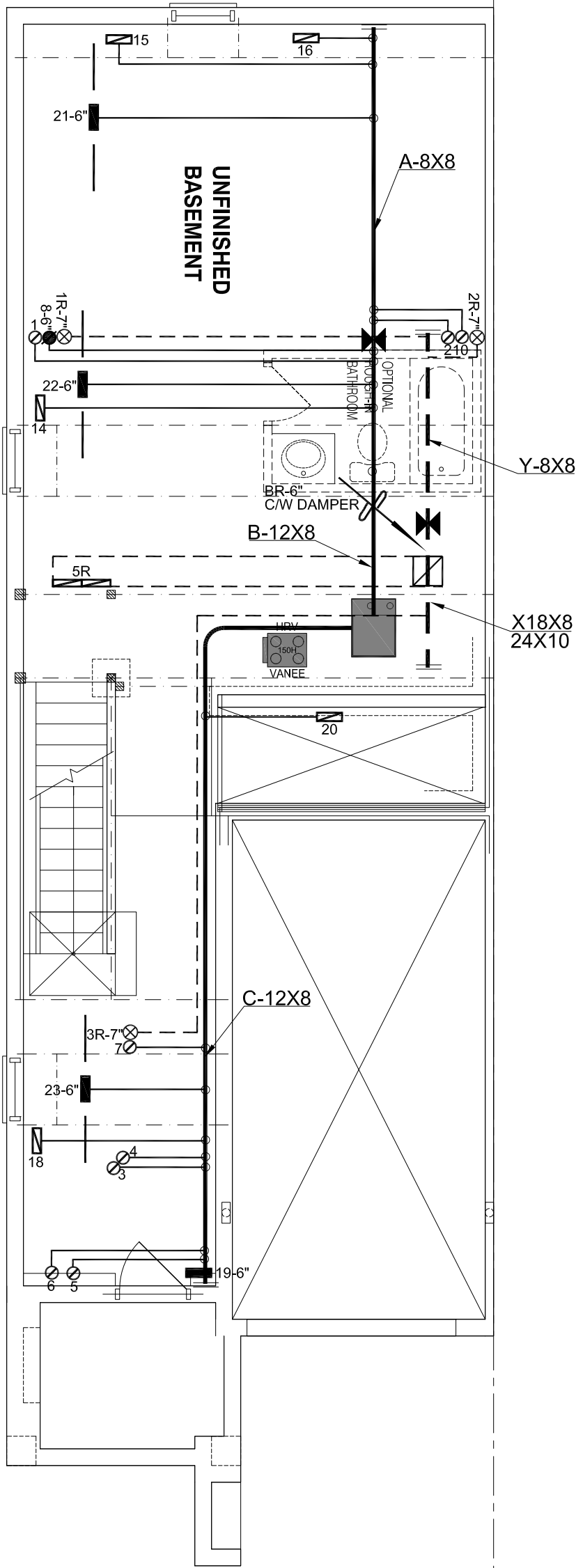
Weather Station Description				
Province:	Ontario			
Region:	Cambridge			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.71			
Building Configuration				
Type:	Semi			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	679.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	905.7 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	30.0	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 3E
LO# 98655

Michael O'Rourke BCIN# 19669



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

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

CSA-F280-12

PACKAGE A1

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

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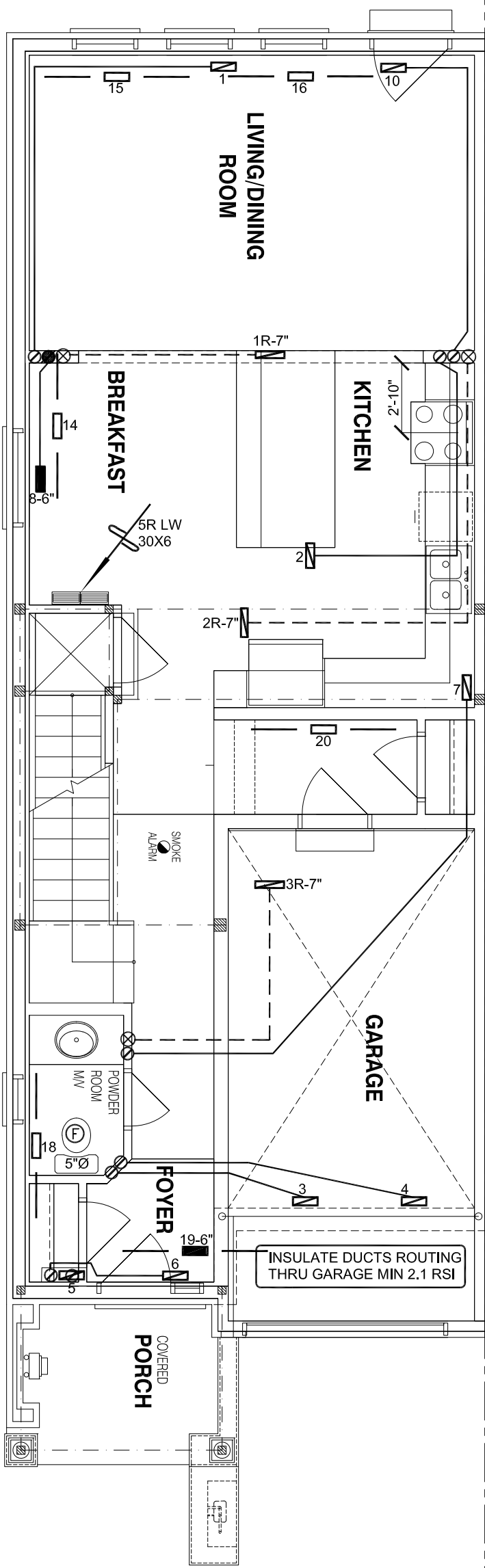
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	HEAT LOSS 30611 BTU/H		# OF RUNS S/A R/A FANS				Sheet Title		
GREENPARK HOMES			UNIT DATA		3RD FLOOR				BASEMENT HEATING LAYOUT		
Project Name			MAKE GOODMAN		2ND FLOOR		9	3	3	Date	
BARLASSINA CAMBRIDGE, ONTARIO			MODEL GMEC960402BNA		1ST FLOOR		6	1	2		
Block 122 Units 55 to 60			INPUT 40 MBTU/H		BASEMENT		3	1	0		
WILLOW 3E 1775 sqft			OUTPUT 38.4 MBTU/H		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A						Scale
			COOLING 1.5 TONS		BCIN# 19669						
			FAN SPEED 695 cfm @ 0.6" w.c.		LO# 98655						

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.

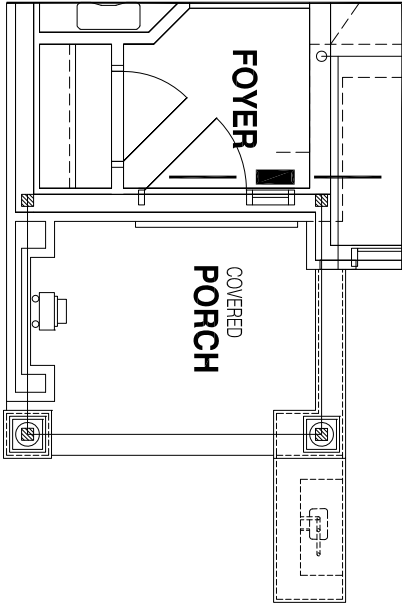
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Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

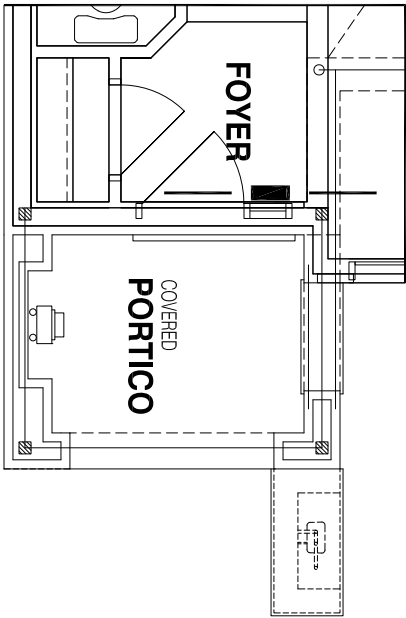
FIRST FLOOR PLAN EL-1



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FIRST FLOOR PLAN EL-3



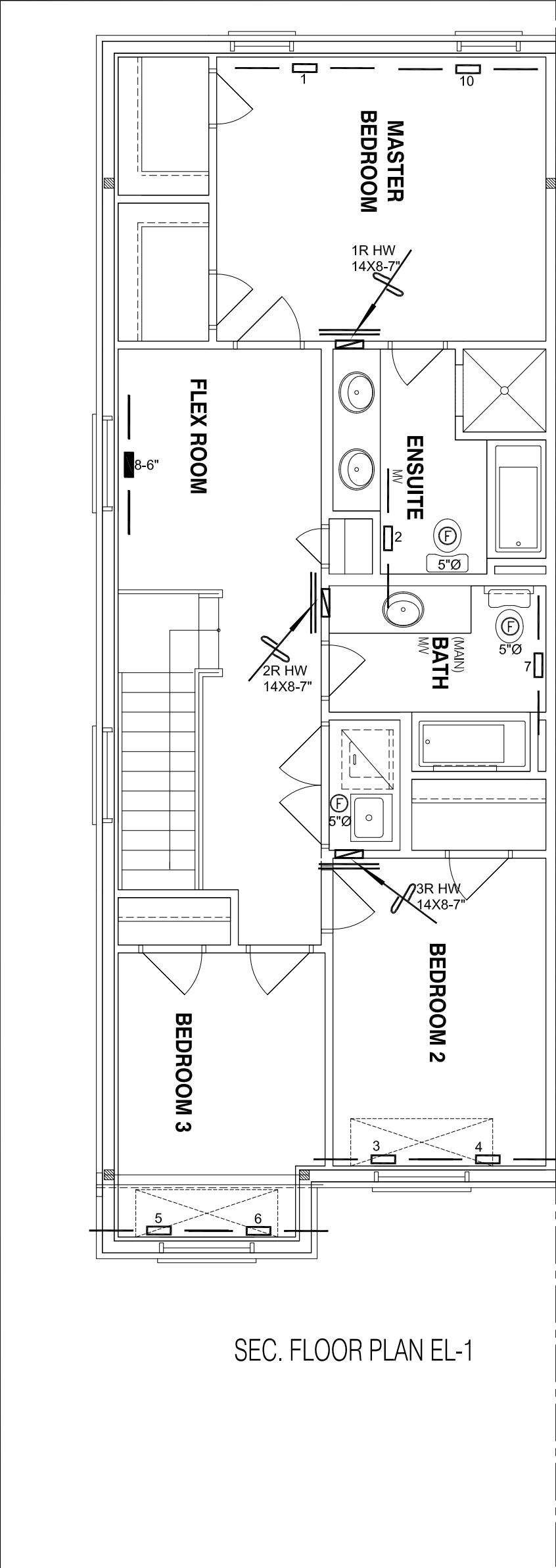
FIRST FLOOR PLAN EL-2

CSA-F280-12
PACKAGE A1

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

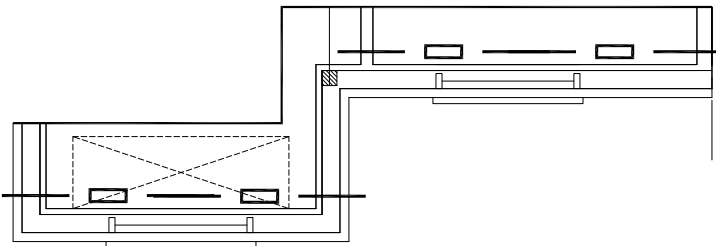
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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title	
GREENPARK HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	AUG/2022
BARLASSINA CAMBRIDGE, ONTARIO			Scale	3/16" = 1'-0"
Block 122 Units 55 to 60			BCIN# 19669	
WILLOW 3E	1775 sqft		LO#	98655

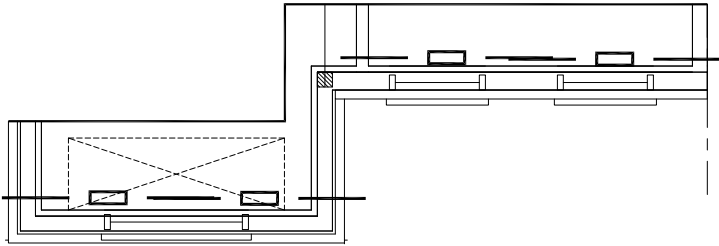


SEC. FLOOR PLAN EL-1

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SEC. FLOOR PLAN EL-3



SEC. FLOOR PLAN EL-2

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

CSA-F280-12
PACKAGE A1

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

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GREENPARK HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	AUG/2022
BARLASSINA CAMBRIDGE, ONTARIO			Scale	3/16" = 1'-0"
Block 122 Units 55 to 60			BCIN# 19669	
WILLOW 3E	1775 sqft		LO#	98655