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: ZADORRA ESTATES INC | DATE: May-23 | WINTER NATURAL AIR CHANGE RATE 0.340 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: [illegible] | GFA: 3214 | LO# 101174 | SUMMER NATURAL AIR CHANGE RATE 0.094 | HEAT GAIN ΔT °F. 11 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			[illegible]-2			BED-3			BED-4			ENS-2			ENS-3			LOFT			ENS-4		
EXP. WALL			35			28						24			17			8			16			20			12		
CLG. HT.			9			9			[illegible]			9			9			9			9			9			9		
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	315			252			0			216			153			72			144			180			108		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	20.8	15.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	166	124	0	0	0	0	0	0	0	0	0
EAST	20.8	41.0	0	0	0	0	0	0	0	0	0	38	789	1560	0	0	0	0	0	0	12	249	493	0	0	0	0	0	0
SOUTH	20.8	24.4	0	0	0	23	478	561	0	0	0	0	0	0	33	686	805	0	0	0	0	0	0	12	249	293	26	540	634
WEST	20.8	41.0	36	748	1478	18	374	739	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	36.4	100.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	19.6	2.9	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	4.4	0.6	279	1216	180	211	919	136	0	0	0	142	619	92	178	776	115	120	523	78	64	279	41	132	575	85	168	732	109	82	357	53
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	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	0	0	0
EXPOSED CLG	1.3	0.6	305	382	170	212	266	118	0	0	0	230	288	128	224	281	125	180	226	100	117	147	65	117	147	65	178	223	99	120	150	67
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	0	0	0	0	0	0	224	558	83	0	0	0	117	291	43	117	291	43	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				2346			2037			0			1322			2403			1434			883			1262			1204			1048	
SUB TOTAL HT GAIN					1828			1554			0			529			1882			983			273			686			500			754
LEVEL FACTOR / MULTIPLIER			0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29	
AIR CHANGE HEAT LOSS				671			583			0			378			688			410			253			361			345			300	
AIR CHANGE HEAT GAIN					90			77			0			26			93			49			14			34			25			37
DUCT LOSS				0			0			0			0			309			0			114			162			0			0	
DUCT GAIN					0			0			0			0			304			0			29			72			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					829			0			0			829			829			829			0			0			829			0
TOTAL HT LOSS BTU/H				3017			2620			0			1701			3400			1844			1249			1786			1549			1348	
TOTAL HT GAIN x 1.3 BTU/H					4195			2121			0			2112			4353			2731			410			1030			1760			1029

ROOM USE			LV/DN			FML			KT/BT			OFFICE			LAUN			PWD			FOY			MUD						WOD			BAS	
EXP. WALL			27			36			38			37			17			16			12			12						47			198		
CLG. HT.			10			10			10			10			10			10			10			10						9			9		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	270			360			380			370			170			160			120			120						423			1329		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN				LOSS	GAIN		LOSS	GAIN
NORTH	20.8	15.5	0	0	0	0	0	0	0	0	0	0	0	0	9	187	139	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
EAST	20.8	41.0	0	0	0	0	0	0	0	0	0	51	1060	2093	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	4	83	164
SOUTH	20.8	24.4	70	1454	1708	28	582	683	0	0	0	41	852	1000	0	0	0	0	0	0	20	416	488	0	0	0				0	0	0	0	0	0
WEST	20.8	41.0	0	0	0	32	665	1314	66	1371	2709	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				7	145	287	0	0	0
SKYLT.	36.4	100.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
DOORS	19.6	2.9	0	0	0	0	0	0	0	0	0	20	392	58	0	0	0	0	0	0	22	431	64	20	392	58				0	0	0	20	392	58
NET EXPOSED WALL	4.4	0.6	200	871	129	300	1307	194	314	1368	203	258	1124	167	161	701	104	160	697	103	78	340	50	100	436	65				0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				275	966	143	453	1592	236
EXPOSED CLG	1.3	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				0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
EXPOSED FLOOR	2.5	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
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0								6795	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0						0			
SUBTOTAL HT LOSS				2326			2554			2739			3427			888			697			1186			827						1112			8861	
SUB TOTAL HT GAIN					1837			2190			2912			3318			243			103			602			123						431			458
LEVEL FACTOR / MULTIPLIER			0.30	0.41		0.30	0.41		0.30	0.41		0.30	0.41		0.30	0.41		0.30	0.41		0.30	0.41		0.30	0.41								0.50	1.00	
AIR CHANGE HEAT LOSS				950			1044			1119			1400			363			285			485			338									9974	
AIR CHANGE HEAT GAIN					91			108			144			164			12			5			30			6										44
DUCT LOSS				0			0			0			0			0			0			0			0									0	
DUCT GAIN					0			0			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	0		0
HEAT GAIN APPLIANCES/LIGHTS					0			0			829			829			829			0			0			829						0			829
TOTAL HT LOSS BTU/H				3276			3597			3859			4827			1252			982			1671			1165						1112			18835	
TOTAL HT GAIN x 1.3 BTU/H					2506			2988			5051			5605			1409			141			821			1245						560			1730

TOTAL HEAT GAIN BTU/H: 42035 TONS: 3.50 LOSS DUE TO VENTILATION LOAD BTU/H: 1593 STRUCTURAL HEAT LOSS: 59090 TOTAL COMBINED HEAT LOSS BTU/H: 60683

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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SITE NAME: ZADORRA ESTATES INC
BUILDER: GREENPARK HOMES
TYPE: CAROL 12
DATE: May-23
GFA: 3214
LO# 101174

HEATING CFM 1504 | COOLING CFM 1504 | TOTAL HEAT LOSS 59,090 | TOTAL HEAT GAIN 41,798 | AIR FLOW RATE CFM 25.45 | AIR FLOW RATE CFM 35.98

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

#*GOODMAN
GMEC960804CNA 80
FAN SPEED
LOW 868
MEDLOW 978
MEDIUM 1112
MEDIUM HIGH 1504
HIGH 1615

AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = **76,800**
DESIGN CFM = **1504**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 47 °F

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

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

RUN #	1	2		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	BED-4	ENS-2	ENS-3	LOFT	MBR	ENS-4	LV/DN	FML	KT/BT	KT/BT	OFFICE	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.51	2.62		1.70	1.70	0.92	1.25	1.79	1.55	1.51	1.35	1.64	1.80	1.93	1.93	2.41	1.25	0.98	1.67	1.17	3.99	3.99	3.99	3.99
CFM PER RUN HEAT	38	67		43	43	23	32	45	39	38	34	42	46	49	49	61	32	25	43	30	102	102	102	102
RM GAIN MBH.	2.10	2.12		2.11	2.18	1.37	0.41	1.03	1.76	2.10	1.03	1.25	1.49	2.53	2.53	2.80	1.41	0.14	0.82	1.24	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	75	76		76	78	49	15	37	63	75	37	45	54	91	91	101	51	5	30	45	16	16	16	16
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	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	28	41		48	56	37	52	62	54	36	53	26	33	17	26	52	40	38	44	33	19	20	12	21
EQUIVALENT LENGTH	130	150		230	190	180	120	230	200	160	150	160	130	110	120	110	180	140	130	150	140	80	120	150
TOTAL EFFECTIVE LENGTH	158	191		278	246	217	172	292	254	196	203	186	163	127	146	162	220	178	174	183	159	100	132	171
ADJUSTED PRESSURE	0.11	0.09		0.06	0.07	0.08	0.1	0.06	0.07	0.09	0.08	0.09	0.11	0.13	0.11	0.1	0.08	0.1	0.1	0.09	0.1	0.16	0.12	0.09
ROUND DUCT SIZE	5	**6**		**6**	**6**	5	4	5	**6**	5	4	4	5	**6**	**6**	**6**	5	4	4	4	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	279	342		219	219	169	367	330	199	279	390	482	338	250	250	311	235	287	493	344	520	520	520	520
COOLING VELOCITY (ft/min)	551	388		388	398	360	172	272	321	551	424	516	396	464	464	515	374	57	344	516	82	82	82	82
OUTLET GRILL SIZE	3X10	4X10		4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B		C	D	B	C	D	D	A	C	C	A	A	A	D	C	D	D	C	A	B	B	C

RUN #	25	26	27	28	29	30
ROOM NAME	BAS	BED-3	BED-4	OFFICE	FML	LV/DN
RM LOSS MBH.	3.99	1.70	0.92	2.41	1.80	1.64
CFM PER RUN HEAT	102	43	23	61	46	42
RM GAIN MBH.	0.46	2.18	1.37	2.80	1.49	1.25
CFM PER RUN COOLING	16	78	49	101	54	45
ADJUSTED PRESSURE	0.16	0.17	0.17	0.16	0.17	0.17
ACTUAL DUCT LGH.	44	59	60	54	25	36
EQUIVALENT LENGTH	120	200	180	110	90	120
TOTAL EFFECTIVE LENGTH	164	259	240	164	115	156
ADJUSTED PRESSURE	0.1	0.07	0.07	0.1	0.15	0.11
ROUND DUCT SIZE	**6**	**6**	5	**6**	5	4
HEATING VELOCITY (ft/min)	520	219	169	311	338	482
COOLING VELOCITY (ft/min)	82	398	360	515	396	516
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	3X10	3X10
TRUNK	D	D	C	D	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	322	0.09	8.9	10	x	8	580	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	662	0.08	12	16	x	8	745	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	842	0.06	14.1	24	x	8	632	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	462	0.06	11.3	16	x	8	520	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	1504	0.05	18.4	32	x	10	677
TRUNK Y	480	0.05	12	16	x	8	540
TRUNK Z	250	0.05	9.4	10	x	8	450
DROP	1504	0.05	18.4	24	x	14	645

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	128	115	115	135	115	135	391	115	0	0	0	0	0	0	0	255
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.	33	69	67	43	65	42	22	43	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	195	215	255	240	230	205	155	235	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	228	284	322	283	295	247	177	278	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.05	0.05	0.05	0.06	0.08	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7	7	7	7.5	7	7	9.9	7	0	0	0	0	0	0	0	7.9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	14	30	14	0	0	0	0	0	0	0	24

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: CAROL 12 LO # 101174
SITE NAME: ZADORRA ESTATES INC

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	6	@ 10.6 cfm	63.6	cfm
Other Rooms	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A.		TOTAL	180.2	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	180.2	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	100.7	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE V150H Location: BSMT

79.5 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
79.5 CFM	X	74 F	X	1.08	X	0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR

Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-4	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: May-23

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

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

HVAC DESIGNS LTD.

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

CSA-F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 101174 Model: CAROL 12 Builder: GREENPARK HOMES Date: 2023-05-10

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1523	9	13707
First	1523	10	15230
Second	1691	9	15219
Third	0	9	0
Fourth	0	9	0
		Total:	44,156.0 ft³
		Total:	1250.4 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.340
SUMMER NATURAL AIR CHANGE RATE	0.094

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-19	41	74
Summer DTDc	24	30	6	11

5.2.3.1 Heat Loss due to Air Leakage

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

0.340 x 347.32 x 41 °C x 1.2 = 5846 W

= **19948 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.094 x 347.32 x 6 °C x 1.2 = 238 W

= **813 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

80 CFM x 74 °F x 1.08 x 0.25 = **1593 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

80 CFM x 11 °F x 1.08 x 0.25 = **236 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	19,948	9,973	1.000
2	0.3		14,645	0.409
3	0.2		13,940	0.286
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: CAROL 12 **LO#** 1011 **BUILDER:** GREENPARK HOMES
SFQT: 3214 **SITE:** ZADORRA ESTATES INC

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75
		WINDOW SHGC	0.50

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):	44156.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
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: 37.0 ft	EXPOSED PERIMETER:	198.0 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

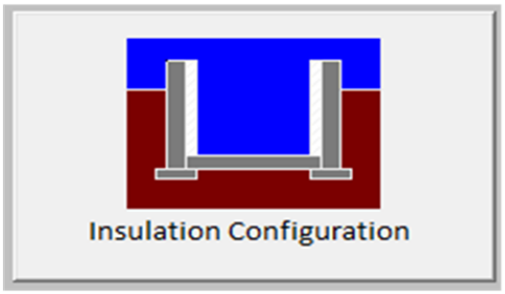
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Oshawa
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**18.9**	
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.0**	
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):	**1991**	

TYPE: CAROL 12
LO# 101174

Michael O'Rourke BCIN #19669

HVAC Designs Ltd.
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Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

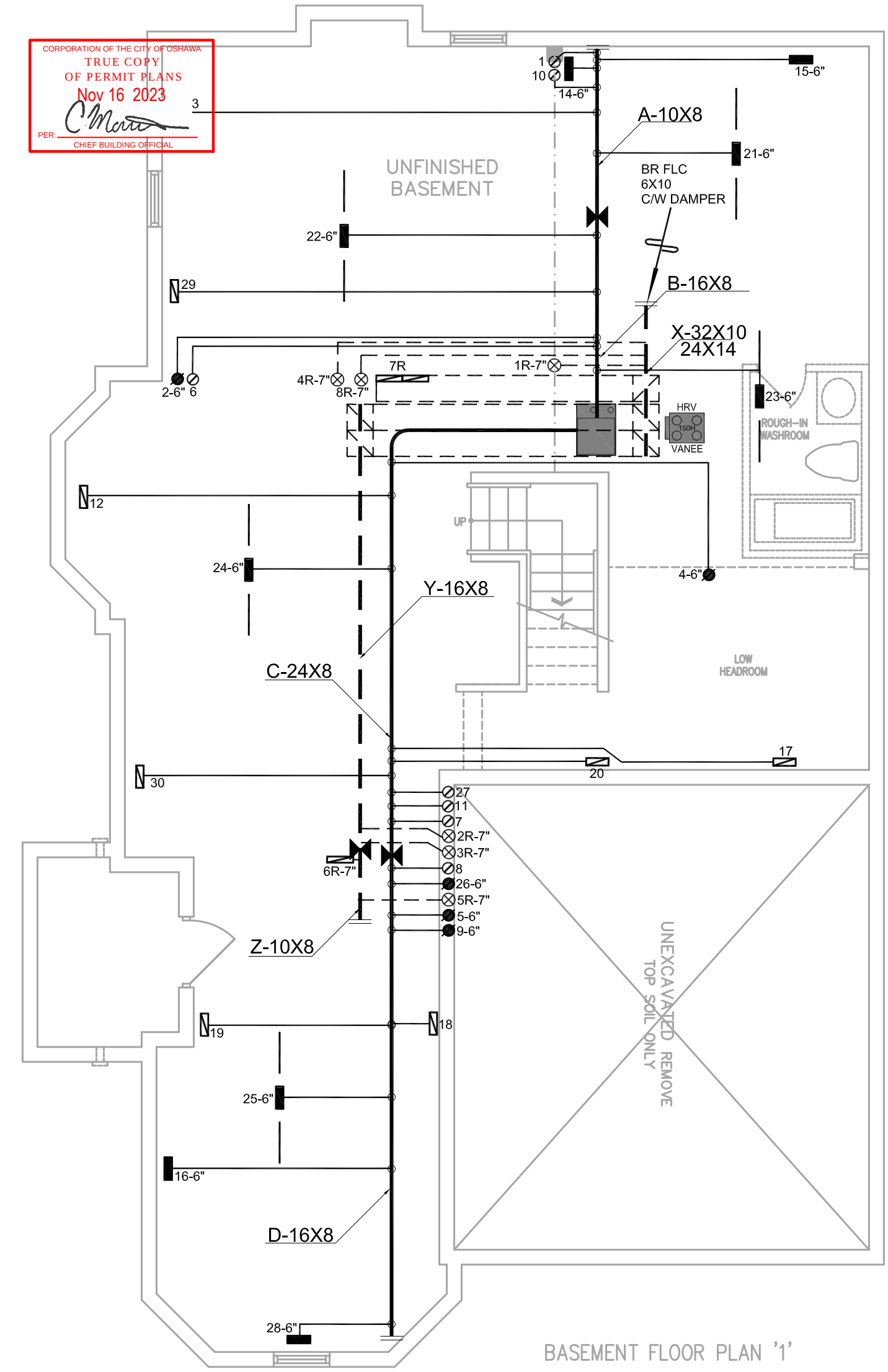
Weather Station Description	
Province:	Ontario
Region:	Oshawa
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.62
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1250.4
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1666.8 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 37.5 / Total Exhaust 37.5
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.340**
Cooling Air Leakage Rate (ACH/H):	**0.094**

TYPE: CAROL 12
LO# 101174

Michael O'Rourke BCIN# 19669

CORPORATION OF THE CITY OF OSHAWA
TRUE COPY
OF PERMIT PLANS
Nov 16 2023
PER: _____
CHIEF BUILDING OFFICIAL

PARTIAL BASEMENT PLAN
FOR DECK CONDITION



BASEMENT FLOOR PLAN '1'

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

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 BCIN # 19669
HVAC Designs Ltd.

PACKAGE A1

Client
GREENPARK HOMES

Project Name
ZADORRA ESTATES INC
OSHAWA, ONTARIO

CAROL 12 3214 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	60683 BTU/H
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960804CNA
INPUT	80 MBTU/H
OUTPUT	76.8 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1504 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	6	4
1ST FLOOR	12	2	3
BASEMENT	5	1	0

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

Sheet Title
BASEMENT HEATING LAYOUT

Date MAY/2023
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 101174

CORPORATION OF THE CITY OF OSHAWA
TRUE COPY
OF PERMIT PLANS
Nov 16 2023
PER:
CHIEF BUILDING OFFICIAL

SLIDING DOOR
GAS FIRE PLACE
COFFERED CEILING
BREAKFAST
FAMILY ROOM
7R LW 30X8
4R-7"
8R-7"
1R-7"
ISLAND
FLUSH BREAKFAST BAR
DW
KITCHEN
6'-7"
RAILING
OPTIONAL 10" CEILING
UP
PANTRY
F
LIVING/ DINING ROOM
OPEN TO ABOVE
RAILING
DN
DN
W.I.C.
MUD ROOM
LAUNDRY
4-6"
5"Ø
W
T
D
6R LW 14X8
DOOR WHERE GRADE PERMIT
2R-7"
3R-7"
7
5R-7"
GARAGE
FOYER
POWDER
5"Ø
FRENCH DOORS
8
5-6"
26-6"
16-6"
HOME OFFICE
28-6"
INSULATE DUCTS ROUTING THRU GARAGE MIN 2.1 RSI
FIRST FLOOR PLAN '1'
FIRST FLOOR PLAN '2'
FIRST FLOOR PLAN '3'
FRENCH DOORS

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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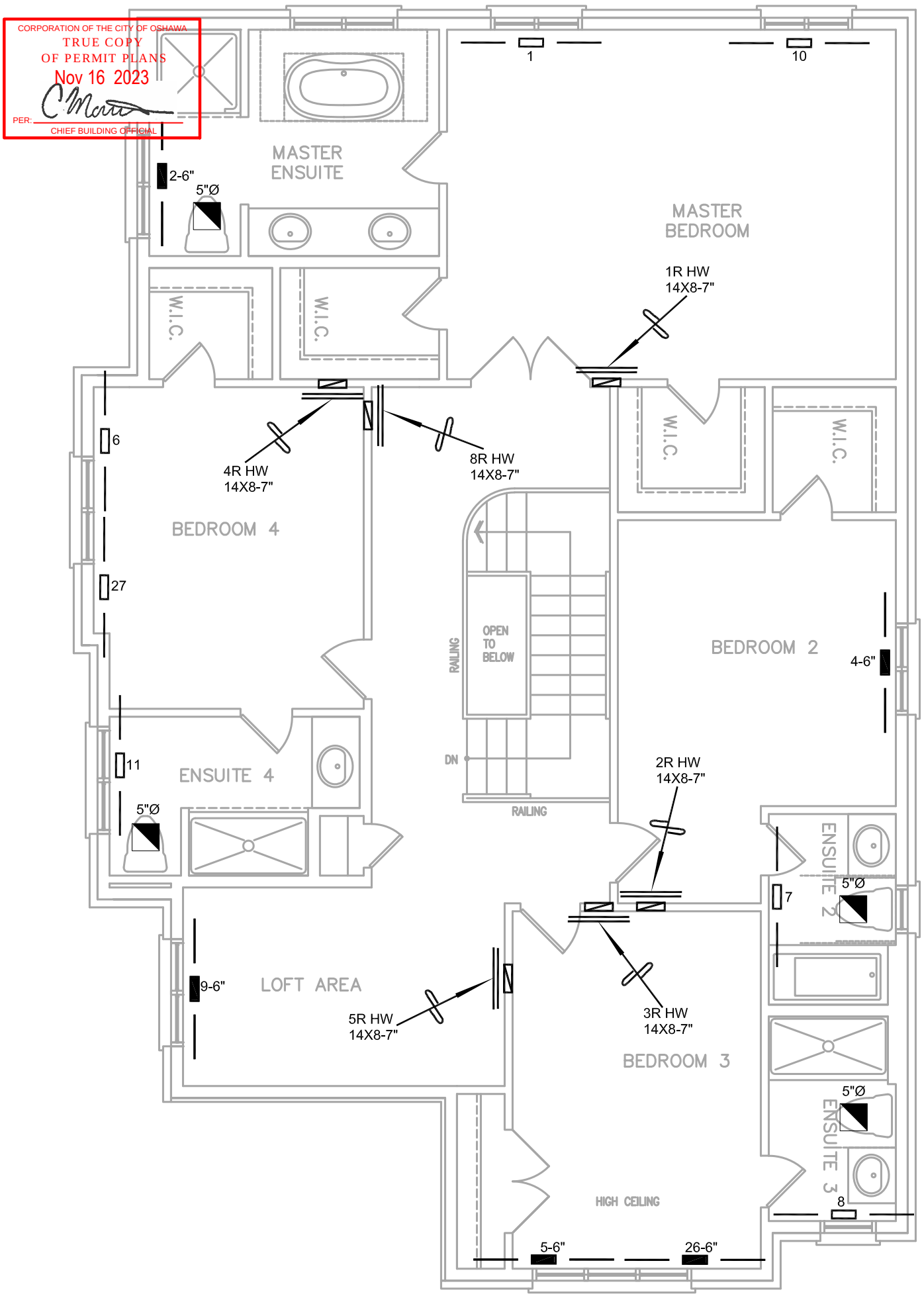
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date MAY/2023
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 101174



SECOND FLOOR PLAN '1'

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
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Sheet Title
SECOND FLOOR HEATING LAYOUT

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LO# 101174

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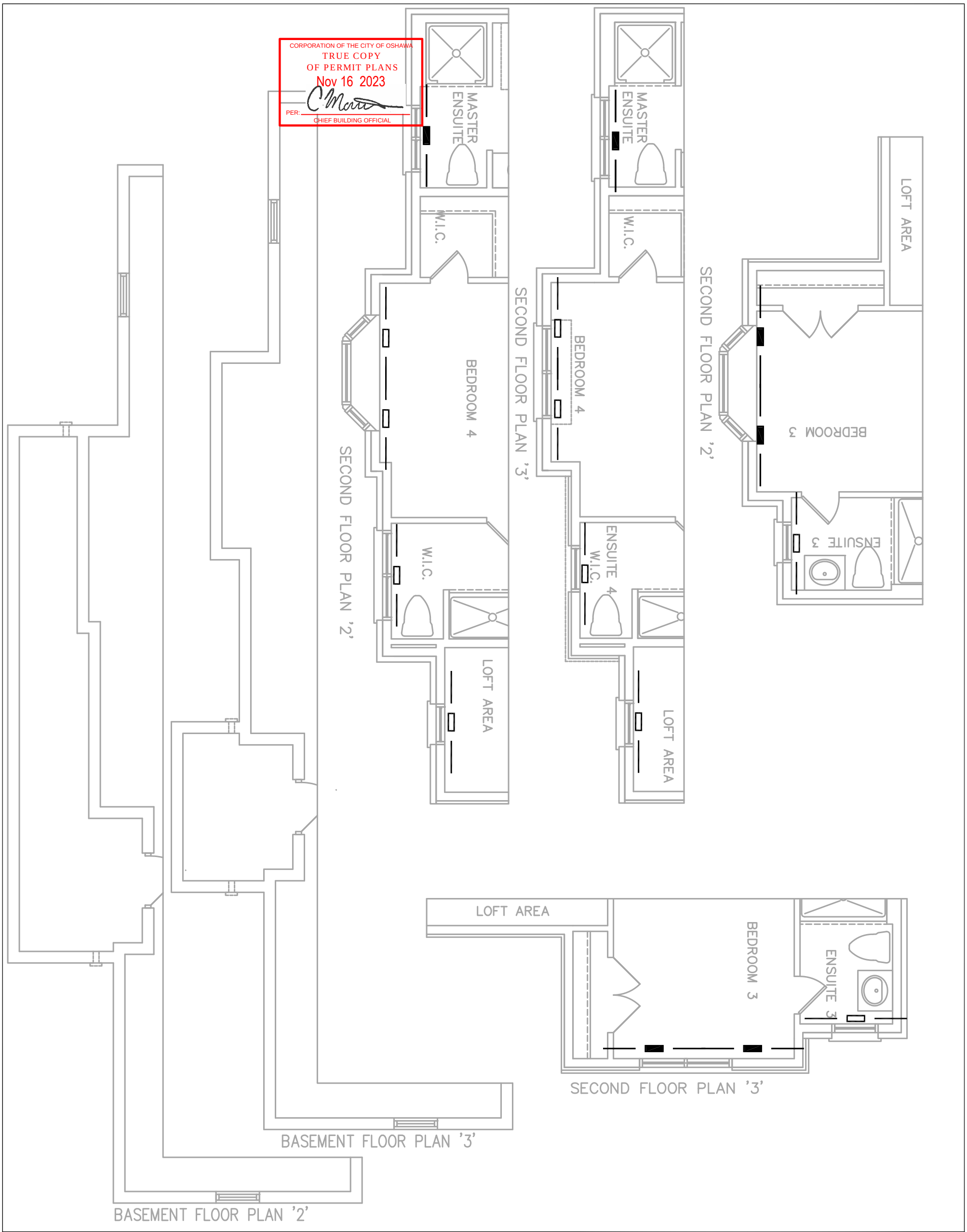

HVAC LEGEND

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Sheet Title
ELEVATION
HEATING
LAYOUT

Date MAY/2023
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BCIN# 19669
LO# 101174