

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

A. Project Information			
Building number, street name		Lot:	
87-3		Lot/con.	
Municipality	Brampton	Postal code	Plan number/ other description
B. Individual who reviews and takes responsibility for design activities			
Name		Firm	
David DaCosta		gtaDesigns Inc.	
Street address		Unit no.	Lot/con.
2985 Drew Road, Suite 202			
Municipality	Postal code	Province	E-mail
Mississauga	L4T 0A4	Ontario	dave@gtadesigns.ca
Telephone number	Fax number	Cell number	
(905) 671-9800	(647) 494-9643	(416) 268-6820	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 of Division C]			
☐ House	☒ HVAC – House	☐ Building Structural	
☐ Small Buildings	☐ Building Services	☐ Plumbing – House	
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings	
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems	
Description of designer's work		Model Certification	
		Project #:	PJ-00067
		Layout #:	JB-00856
Heating and Cooling Load Calculations		Builder	Highcastle Homes
Air System Design		Project	Riverwalk Phase 2
Residential mechanical ventilation Design Summary		Model	87-3
Residential System Design per CAN/CSA-F280-12		SB-12	Package J
Residential New Construction - Forced Air			
D. Declaration of Designer			
I, <u>David DaCosta</u> declare that (choose one as appropriate): (print name) ☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4 Division C of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____ ☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5 of Division C, of the Building Code. Individual BCIN: <u>32964</u> Basis for exemption from registration: <u>Division C 3.2.4.1. (4)</u> ☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification:			
I certify that: - The information contained in this schedule is true to the best of my knowledge. - I have submitted this application with the knowledge and consent of the firm.			
<u>August 5, 2015</u> Date		 Signature of Designer	

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d), of Division C, Article 3.2.5.1. of Division C and all other persons who are exempt from qualifications under Subsections 3.2.4 . and 3.2.5. of Division C.
- Schedule 1 does not require to be completed a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited licence to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Heat loss and gain calculation summary sheet				CSA-F280-M12 Standard Form No. 1	
These documents issued for the use of Highcastle Homes				Layout No.	
and may not be used by any other persons without authorization. Documents for permit and/or construction are signed in red.				JB-00856	
Building Location					
Address (Model): 87-3			Site: Riverwalk Phase 2		
Model:			Lot:		
City and Province: Brampton			Postal code:		
Calculations based on					
Dimensional information based on:			N/A		
Attachment: Detached			Front facing: East/West		Assumed? Yes
No. of Levels: 3		Ventilated? Included	Air tightness: 1961- Present (ACH=3.57)		Assumed? Yes
Weather location: Brampton			Wind exposure: Shelterd		
HRV? VanEE		60H	Internal shading: Light-translucent		Occupants: 6
Sensible Eff. at -25C 55%		Apparent Effect. at -0C 68%	Units: Imperial		Area Sq ft: 7156
Sensible Eff. at -0C 65%					
Heating design conditions			Cooling design conditions		
Outdoor temp -2.2 Indoor temp: 72 Mean soil temp 48			Outdoor temp 86 Indoor temp: 75 Latitude: 44		
Above grade walls			Below grade walls		
Style A: As per Selected OBC SB12 Package J R 22			Style A: As per Selected OBC SB12 Package J R 12		
Style B: Existing Walls (When Applicable) R 12			Style B:		
Style C:			Style C:		
Style D:			Style D:		
Floors on soil			Ceilings		
Style A: As per Selected OBC SB12 Package J			Style A: As per Selected OBC SB12 Package J R 50		
Style B:			Style B: As per Selected OBC SB12 Package J R 31		
Exposed floors			Style C:		
Style A: As per Selected OBC SB12 Package J R 31			Doors		
Style B:			Style A: As per Selected OBC SB12 Package J R 3.01		
Windows			Style B:		
Style A: As per Selected OBC SB12 Package J R 3.15			Style C:		
Style B: Existing Windows (When Applicable) R 1.99			Skylights		
Style C:			Style A: As per Selected OBC SB12 Package J R 2.03		
Style D:			Style B:		
Attached documents: As per Shedule 1					
Notes: Residential New Construction - Forced Air					
Calculations performed by					
Name: David DaCosta			Postal code: L4T 0A4		
Company: gtaDesigns Inc.			Telephone: (905) 671-9800		
Address: 2985 Drew Road, Suite 202			Fax: (416) 268-6820		
City: Mississauga			E-mail dave@gtadesigns.ca		



I review and take responsibility for the design work and am qualified in the appropriate category as an "other designer" under Division C subsection 3.2.5. of the Building Code.

Page 3

Date: August 5, 2015

Model: 87-3

System 1

Individual BCIN: 32964

David DaCosta

Project # PJ-00067
Layout # JB-00856

	Level 3												Level 4															
S/A Outlet No.	14	15	16	17	18	19	20	21	22	23	24																	
Room Use	BED 3	ENS 4	BED 4	BED 4	BED 5	BED 5	ENS 5	LAUN 2	BED 2	BED 2	BED 3																	
Btu/Outlet	1785	685	2671	2671	2113	2113	715	215	2978	2978	1785																	
Heating Airflow Rate CFM	37	14	55	55	43	43	15	4	61	61	37																	
Cooling Airflow Rate CFM	45	12	71	71	57	57	6	70	43	43	45																	
Duct Design Pressure	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	
Actual Duct Length	78	70	85	84	84	95	82	23	37	42	84																	
Equivalent Length	200	170	175	170	200	180	180	120	140	130	160	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90		
Total Effective Length	278	240	260	254	284	275	262	143	177	172	244	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90		
Adjusted Pressure	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.09	0.07	0.08	0.05	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14		
Duct Size Round	5	3	6	6	6	6	3	5	5	5	5																	
Outlet Size	3x10	3x10	4x10	4x10	4x10	4x10	3x10	3x10	3x10	3x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10		
Trunk	C	C	D	D	E	E	E	A	A	A	C																	

Return Branch And Grill Sizing	Grill Pressure Loss					0.02 "w.c					
R/A Inlet No.	1R	2R	3R	4R	5R	6R	7R	8R	9R	10R	11R
Inlet Air Volume CFM	193	453	158	105	158	105					
Duct Design Pressure	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Actual Duct Length	15	58	59	29	74	27					
Equivalent Length	95	175	160	160	220	170	70	70	70	70	70
Total Effective Length	110	233	219	189	294	197	70	70	70	70	70
Adjusted Pressure	0.11	0.05	0.05	0.06	0.04	0.06	0.17	0.17	0.17	0.17	0.17
Duct Size Round	8.0	12.0	8.5	6.0	8.5	6.0					
Inlet Size	FLC	8	8	8	8	8					
" "	x	x	x	x	x	x	x	x	x	x	x
Inlet Size		30	14	14	14	14					
Trunk	Y	X	X	Z	X	Z					

Return Trunk Duct Sizing					
Trunk	CFM	Press.	Round	Rect. Size	
Drop	1172	0.04	18.0	24x12	
Z	1172	0.04	18.0	30x10	24x12
Y	962	0.04	16.5	32x8	24x12
X	769	0.04	15.5	28x8	22x12
W					
V					
U					
T					
S					
R					
Q					

Supply Trunk Duct Sizing					
Trunk	CFM	Press.	Round	Rect. Size	
A	1171	0.05	17.0	26x10	22x12
B	497	0.05	12.5	18x8	14x10
C	198	0.05	9.0	8x8	10x7
D	471	0.05	12.0	16x8	12x10
E	323	0.05	10.5	12x8	10x10
F	222	0.05	9.5	10x8	
G					
H					
I					
J					
K					

2012 OBC

Builder: Highcastle Homes

Date: August 5, 2015

Project: Riverwalk Phase 2

Model: 87-3

System 1

Weather Data Brampton 44 -2.2 86 20 48.2

Heat Loss ^T 74.2 deg. F Ht gain ^T 11 deg. F GTA: 7156

Project # PJ-00067
Layout # JB-00856

Level 1			BASE																		
Run ft. exposed wall A	125	A		A		A		A		A		A		A		A		A			
Run ft. exposed wall B		B		B		B		B		B		B		B		B		B			
Ceiling height	2.0	AG		2.0	AG		2.0	AG		2.0	AG		2.0	AG		2.0	AG		2.0	AG	
Floor area	1276	Area		Area		Area		Area		Area		Area		Area		Area		Area			
Exposed Ceilings A	A			A		A		A		A		A		A		A		A			
Exposed Ceilings B	B			B		B		B		B		B		B		B		B			
Exposed Floors	Flr			Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr			
Gross Exp Wall A	250																				
Gross Exp Wall B																					
Components	R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain		
North Shaded	3.15	23.56	11.31	6	141	128															
East/West	3.15	23.56	27.75																		
South	3.15	23.56	21.28																		
Existing Windows	1.99	37.29	22.15																		
Skylight	2.03	36.55	88.23	42	1035	153															
Doors	3.01	24.65	3.65																		
Net exposed walls A	8.50	8.73	1.29				202		261												
Net exposed walls B	8.50	8.73	1.29																		
Exposed Ceilings A	50.00	1.48	0.76																		
Exposed Ceilings B	22.86	3.25	1.66																		
Exposed Floors	22.05	3.37	0.23																		
Foundation Conductive Heatloss		On Grade () or Above			8135																
Total Conductive	Heat Loss				9311																
	Heat Gain					543															
Air Leakage	Heat Loss/Gain	0.9623	0.0559		8960	30															
Ventilation	Case 1		0.12																		
	Case 2		25.64	11.88																	
	Case 3	x	0.06	0.08	588	42															
Heat Gain People																					
Appliances Loads		1 =.25 percent	5596																		
Duct and Pipe loss			10%																		
Level 1 HL Total	18,860	Total HL for per room		18860																	
Level 1 HG Total	799	Total HG per room x 1.3			799																

Level 2		DIN		PWD		LIV		FOY		DEN		FOY 2		A		A		A		A		A	
Run ft. exposed wall A		21 A		7 A		41 A		10 A		32 A		17 A		A B		A B		A B		A B		A B	
Run ft. exposed wall B		B		B		B		B		B		B		B		B		B		B		B	
Ceiling height		11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0	
Floor area		514 Area		94 Area		250 Area		168 Area		302 Area		65 Area		Area		Area		Area		Area		Area	
Exposed Ceilings A		A		A		A		A		A		A		A		A		A		A		A	
Exposed Ceilings B		B		B		B		B		B		B		B		B		B		B		B	
Exposed Floors		Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr	
Gross Exp Wall A		231		77		451		110		352		187											
Gross Exp Wall B																							
Components		R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	
North Shaded		3.15	23.56	11.31																			
East/West		3.15	23.56	27.75	13	306	361				52	1225	1443	10	236	277	52	1225	1443	12	283	333	
South		3.15	23.56	21.28	27	636	575	7	165	149													
Existing Windows		1.99	37.29	22.15																			
Skylight		2.03	36.55	88.23																			
Doors		3.01	24.65	3.65							26	641	95		35	863	128						
Net exposed walls A		14.49	5.12	0.76	191	978	145	70	358	53	399	2043	303	74	379	56	300	1536	228	140	717	106	
Net exposed walls B		8.50	8.73	1.29																			
Exposed Ceilings A		50.00	1.48	0.76											16	24	12						
Exposed Ceilings B		22.86	3.25	1.66																			
Exposed Floors		22.05	3.37	0.23																			
Foundation Conductive Heatloss		On Grade () or Above		x																			
Total Conductive		Heat Loss			1920			523			3268			1255			2785			1862			
		Heat Gain				1080		202			1746			429			1683			567			
Air Leakage		Heat Loss/Gain		0.4629	0.0559	889	60	242	11		1513	98		581	24		1289	94		862	32		
Ventilation		Case 1		0.06	0.08																		
		Case 2		25.64	11.88																		
		Case 3		x	0.06	0.08																	
Heat Gain People					121	83		33	16		206	135		79	33		176	130		118	44		
Appliances Loads		1 =.25 percent								1.0		1399					1.0		1399				
Duct and Pipe loss																							
Level 2 HL Total		17,724		Total HL for per room		2930					4987			1916			4250			2842			
Level 2 HG Total		13,861		Total HG per room x 1.3			3410			298		4390		631			4297				835		

I review and take responsibility for the design work and am qualified in the appropriate category as an "other designer" under

Division C subsection 3.2.5. of the Building Code. Individual BCIN:

32964



David DaCosta

SB-12 Package

Package J

Total Heat Loss	57,291	btu/h
Total Heat Gain	29,136	btu/h

2012 OBC

Builder: Highcastle Homes

Date: August 5, 2015

Project: Riverwalk Phase 2

Model: 87-3

System 1

Weather Data Brampton 44 -2.2 86 20 48.2

Heat Loss ^T 74.2 deg. F Ht gain ^T 11 deg. F GTA: 7156

Project # P.J-00067
Layout # JB-00856

Level 3

Run ft. exposed wall A	29 A	7 A	45 A	35 A	10 A	A	42 A	A	A	A	A	A
Run ft. exposed wall B	B	B	B	B	B	B	B	B	B	B	B	B
Ceiling height	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Floor area	401 Area	53 Area	375 Area	370 Area	62 Area	108 Area	368 Area	Area	Area	Area	Area	Area
Exposed Ceilings A	426 A	53 A	605 A	507 A	62 A	112 A	423 A	A	A	A	A	A
Exposed Ceilings B	B	B	B	B	B	B	B	B	B	B	B	B
Exposed Floors	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr
Gross Exp Wall A	261	63	405	315	90		378					
Gross Exp Wall B												

Components	R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
North Shaded	3.15	23.56	11.31																
East/West	3.15	23.56	27.75	12	283	333													
South	3.15	23.56	21.28	31	730	660	7	165	149										
Existing Windows	1.99	37.29	22.15																
Skylight	2.03	36.55	88.23																
Doors	3.01	24.65	3.65																
Net exposed walls A	14.49	5.12	0.76	218	1116	165	56	287	43	342	1751	260	266	1362	202	90	461	68	
Net exposed walls B	8.50	8.73	1.29																
Exposed Ceilings A	50.00	1.48	0.76	426	632	324	53	79	40	605	898	460	507	752	385	62	92	47	112
Exposed Ceilings B	22.86	3.25	1.66																
Exposed Floors	22.05	3.37	0.23																
Foundation Conductive Heatloss																			
Total Conductive																			
Heat Loss				2761				530		4133			3269			553			
Heat Gain					1482			232		2467			1947				115		
Air Leakage	Heat Loss/Gain	0.2295	0.0559	634	83			122	13	948	138		750	109		127	6		
Ventilation	Case 1		0.03																
Case 2			25.64																
Case 3	x		0.06																
Heat Gain People			239	1	174	114		33	18	261	190		206	150		35	9		
Appliances Loads	1 =.25 percent		5596																
Duct and Pipe loss			10%																
Level 3 HL Total	20,708			3569				685		5343			4225			715			
Level 3 HG Total	14,475				2493				341		3945			3178			170		

Level 4

Run ft. exposed wall A	A	A	A	A	A	A	A	A	A	A	A	A
Run ft. exposed wall B	B	B	B	B	B	B	B	B	B	B	B	B
Ceiling height												
Floor area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area
Exposed Ceilings A	A	A	A	A	A	A	A	A	A	A	A	A
Exposed Ceilings B	B	B	B	B	B	B	B	B	B	B	B	B
Exposed Floors	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr
Gross Exp Wall A												
Gross Exp Wall B												

Components	R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
North Shaded	3.15	23.56	11.31																
East/West	3.15	23.56	27.75																
South	3.15	23.56	21.28																
Existing Windows	1.99	37.29	22.15																
Skylight	2.03	36.55	88.23																
Doors	3.01	24.65	3.65																
Net exposed walls A	14.49	5.12	0.76																
Net exposed walls B	8.50	8.73	1.29																
Exposed Ceilings A	50.00	1.48	0.76																
Exposed Ceilings B	22.86	3.25	1.66																
Exposed Floors	22.05	3.37	0.23																
Foundation Conductive Heatloss																			
Total Conductive																			
Heat Loss																			
Heat Gain																			
Air Leakage	Heat Loss/Gain	0.0000	0.0559																
Ventilation	Case 1		0.00																
Case 2			25.64																
Case 3	x		0.06																
Heat Gain People			239																
Appliances Loads	1 =.25 percent		5596																
Duct and Pipe loss			10%																
Level 4 HL Total	0																		
Level 4 HG Total	0																		

I review and take responsibility for the design work and am qualified in the appropriate category as an "other designer" under

Division C subsection 3.2.5. of the Building Code. Individual BCIN:

32964

David DaCosta

David DaCosta

SB-12 Package

Package J

Total Heat Loss	57,291	btu/h
Total Heat Gain	29,136	btu/h

Package: Project: Package J Brampton System: Model: System 1 87-3

Air Leakage Calculations

Building Air Leakage Heat Loss				
B	LRairh	Vb	HL^T	HLleak
0.018	0.316	42440	74.2	17921

Building Air Leakage Heat Gain				
B	LRairh	Vb	HG^T	HG Leak
0.018	0.092	42440	11	775

Air Leakage Heat Loss/Gain Multiplier Table (Section 11)				
Level	Level Factor (LF)	Building Air	Level Conductive Heat Loss	Air Leakage Heat Loss Multiplier
Level 1	0.5	17921	9311	0.9623
Level 2	0.3		11614	0.4629
Level 3	0.2		15620	0.2295
Level 4	0		0	0.0000

Levels			
1	2	3	4
(LF)	(LF)	(LF)	(LF)
1.0	0.6	0.5	0.4
	0.4	0.3	0.3
		0.2	0.2
			0.1

HG LEAK		Air Leakage Heat Gain	
	775		0.0559
BUILDING CONDUCTIVE HEAT GAIN			13863

Levels this Dwelling	
3	

Ventilation Calculations

Ventilation Heat Loss

Ventilation Heat Loss				
C	PVC	HL^T	(1-E) HRV	HLbvent
1.08	90	74.2	0.32	2308

Ventilation Heat Gain

Ventilation Heat Gain			
C	PVC	HG^T	HGbvent
1.1	90	11	1069

Case 1

Ventilation Heat Loss (Exhaust only Systems)

Case 1 - Exhaust Only				
Level	LF	HLbvent	LVL Cond. HL	Multiplier
Level 1	0.5	2308	9311	0.12
Level 2	0.3		11614	0.06
Level 3	0.2		15620	0.03
Level 4	0		0	0.00

Case 1

Ventilation Heat Gain (Exhaust Only Systems)

Case 1 - Exhaust Only		Multiplier	
HGbvent	1069	0.08	
Building	13863		

Case 2

Ventilation Heat Loss (Direct Ducted Systems)

			Multiplier
C	HL^T	(1-E) HRV	25.64
1.08	74.2	0.32	

Case 2

Ventilation Heat Gain (Direct Ducted Systems)

		Multiplier
C	HG^T	11.88
1.08	11	

Case 3

Ventilation Heat Loss (Forced Air Systems)

		HLbvent	Multiplier
Total Ventilation Load		2308	0.06

Case 3

Ventilation Heat Gain (Forced Air Systems)

		Vent Heat Gain	Multiplier
HGbvent	HG*1.3	1069	0.08
1069	1		

Foundation Conductive Heatloss Level 1

2384 Watts 8135 Btu/h

Foundation Conductive Heatloss Level 2

Watts Btu/h

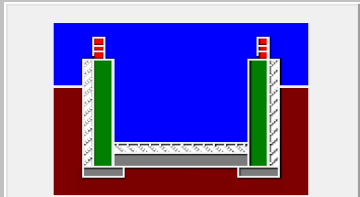
Envelope Air Leakage Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario ▼			
Region:	Brampton ▼			
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				6.4
Type:	Detached ▼			
Number of Stories:	Two ▼			
Foundation:	Full ▼			
House Volume (m ³):	566.3 1201.90			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (ACH=3.57) ▼			
Custom BDT Data:	ELA @ 10 Pa. ▼ 185.83 cm ² 3.57 ACH @ 50 Pa			
Mechanical Ventilation (L/s):	Total Supply:		Total Exhaust:	
	45		45	
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Envelope Air Leakage Rate				
Heating Air Leakage Rate (ACH/H):		0.316		
Cooling Air Leakage Rate (ACH/H):		0.092		

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	▼
Region:	Brampton	▼
Site Description		
Soil Conductivity:	High conductivity: moist soil	▼
Water Table:	Normal (7-10 m, 23-33 Ft)	▼
Foundation Dimensions		
Floor Length (m):	23.25	 Insulation Configuration
Floor Width (m):	5.10	
Exposed Perimeter (m):	38.10	
Wall Height (m):	2.74	
Depth Below Grade (m):	2.13	
Window Area (m ²):	0.56	
Door Area (m ²):	3.90	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	29	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		2384

Builder: **Highcastle Homes**

Date: **August 5, 2015**

I review and take responsibility for the design work and am qualified in the appropriate category as an "other designer" under Division C subsection 3.2.5. of the Building Code.

Page 3

Project: **Riverwalk Phase 2**

Model: **87-3**

System 2

Individual BCIN: 32964

David DaCosta

Project # **PJ-00067**
Layout # **JB-00856**

DESIGN LOAD SPECIFICATIONS		AIR DISTRIBUTION & PRESSURE		FURNACE/AIR HANDLER DATA:		BOILER/WATER HEATER DATA:		A/C UNIT DATA:	
Level 1 Net Load	21,908 btu/h	Equipment External Static Pressure	0.5 "w.c.	Make	Amana	Make	Type	Amana	2.5 Ton
Level 2 Net Load	20,278 btu/h	Additional Equipment Pressure Drop	0.225 "w.c.	Model	GMEC96-0803BNA	Model		Cond.-----	2.5
Level 3 Net Load	18,350 btu/h	Available Design Pressure	0.275 "w.c.	Input Btu/h	80000	Input Btu/h		Coil -----	2.5
Level 4 Net Load	0 btu/h	Return Branch Longest Effective Length	300 ft	Output Btu/h	76800	Output Btu/h			
Total Heat Loss	60,536 btu/h	R/A Plenum Pressure	0.138 "w.c.	E.s.p.	0.50 " W.C.	Min.Output Btu/h	AWH		
Total Heat Gain	29,602 btu/h	S/A Plenum Pressure	0.14 "w.c.	Water Temp	deg. F.	Blower DATA:			
Combo System HL + 10%	66,590 Btu/h	Heating Air Flow Proportioning Factor	0.0194 cfm/btuh	AFUE	96%	Blower Speed Selected:	W2	Blower Type	ECM
Building Volume Vb	50718 ft³	Cooling Air Flow Proportioning Factor	0.0354 cfm/btuh	Aux. Heat				(Brushless DC OBC 12.3.1.5.(2))	
Ventilation Load	3,377 Btu/h.	R/A Temp	70 deg. F.	SB-12 Package	Package J	Heating Check	1172 cfm	Cooling Check	1049 cfm
Ventilation PVC	90 cfm	S/A Temp	131 deg. F.						
Supply Branch and Grill Sizing		Diffuser loss	0.01 "w.c.	Temp. Rise>>>	61 deg. F.	Selected cfm>	1172 cfm	Cooling Air Flow Rate	1049 cfm

	Level 1														Level 2												
S/A Outlet No.	1	2	3	4	5									6	7	8	9	10	11	12	13						
Room Use	BASE	BASE	BASE	BASE	BASE									KIT	KIT	KIT	MUD	LAUN	LAUN	FAM	FAM						
Btu/Outlet	4382	4382	4382	4382	4382									2964	2964	2964	877	3123	3123	2132	2132						
Heating Airflow Rate CFM	85	85	85	85	85									57	57	57	17	60	60	41	41						
Cooling Airflow Rate CFM	7	7	7	7	7									95	95	95	4	88	88	88	88						
Duct Design Pressure	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13		
Actual Duct Length	17	46	53	36	36									50	52	46	18	25	24	20	31						
Equivalent Length	100	100	130	140	130	90	90	90	90	90	90	90	90	90	120	110	110	140	110	120	90	90	90	90	90		
Total Effective Length	117	146	183	176	166	90	90	90	90	90	90	90	90	90	140	172	156	128	165	134	140	121	90	90	90		
Adjusted Pressure	0.11	0.09	0.07	0.07	0.08	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.09	0.08	0.08	0.10	0.08	0.10	0.09	0.11	0.14	0.14	0.14		
Duct Size Round	6	6	6	6	6									6	6	6	3	6	6	6	6						
Outlet Size	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10		
Trunk	A	B	D	C	C									B	C	D	A	A	E	A	A						

	Level 3												Level 4											
S/A Outlet No.	14	15	16	17	18	19	20	21	22	23	24													
Room Use	MAST	MAST	MAST	WARD	ENS 1	WC	ENS 3	WIC	ENS 6	RETR	MAST													
Btu/Outlet	1999	1999	1999	333	1506	793	1497	1103	2112	3013	1999													
Heating Airflow Rate CFM	39	39	39	6	29	15	29	21	41	58	39													
Cooling Airflow Rate CFM	53	53	53	6	39	17	22	7	17	51	53													
Duct Design Pressure	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Actual Duct Length	63	54	55	35	68	70	74	42	37	49	60													
Equivalent Length	155	170	165	170	130	135	140	140	120	150	145	90	90	90	90	90	90	90	90	90	90	90	90	90
Total Effective Length	218	224	220	205	198	205	214	182	157	199	205	90	90	90	90	90	90	90	90	90	90	90	90	90
Adjusted Pressure	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.07	0.08	0.07	0.06	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Duct Size Round	5	5	5	3	5	3	4	4	5	5	5													
Outlet Size	3x10	3x10	3x10	3x10	3x10	3x10	3x10	3x10	3x10	3x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10
Trunk	B	B	B	B	C	C	D	E	E	E	B													

Return Branch And Grill Sizing	Grill Pressure Loss					0.02 "w.c.					
R/A Inlet No.	1R	2R	3R	4R	5R	6R	7R	8R	9R	10R	11R
Inlet Air Volume CFM	211	365	105	158	158	190					
Duct Design Pressure	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Actual Duct Length	10	8	26	39	36	22					
Equivalent Length	170	130	125	200	160	175	70	70	70	70	70
Total Effective Length	180	138	151	239	196	197	70	70	70	70	70
Adjusted Pressure	0.07	0.09	0.08	0.05	0.06	0.06	0.17	0.17	0.17	0.17	0.17
Duct Size Round	8.0	10.0	6.0	8.5	8.0	8.5					
Inlet Size	FLC	8	8	8	8	8					
" "	x	x	x	x	x	x	x	x	x	x	x
Inlet Size		30	14	14	14	14					
Trunk	Z	Z	Y	Y	Y						

Return Trunk Duct Sizing				
Trunk	CFM	Press.	Round	Rect. Size
Drop	1172	0.05	17.0	24x12
Z	1082	0.05	16.5	32x8 24x10
Y	506	0.05	12.5	18x8 14x10
X				
W				
V				
U				
T				
S				
R				
Q				

Supply Trunk Duct Sizing				
Trunk	CFM	Press.	Round	Rect. Size
A	991	0.06	15.5	28x8 22x10
B	746	0.06	14.0	22x8 18x10
C	443	0.06	11.5	14x8 12x10
D	171	0.06	8.0	8x8 8x7
E	181	0.07	8.0	8x8 8x7
F				
G				
H				
I				
J				
K				

2012 OBC

Builder: Highcastle Homes

Date: August 5, 2015

Project: Riverwalk Phase 2

Model: 87-3

System 2

Weather Data Brampton 44 -2.2 86 20 48.2

Heat Loss ^T 74.2 deg. F Ht gain ^T 11 deg. F GTA: 7156

Project # PJ-00067
Layout # JB-00856

Level 1				BASE															
Run ft. exposed wall A	152	A		A		A		A		A		A		A		A		A	
Run ft. exposed wall B	B			B		B		B		B		B		B		B		B	
Ceiling height	2.0	AG		2.0	AG	2.0	AG	2.0	AG	2.0	AG	2.0	AG	2.0	AG	2.0	AG	2.0	AG
Floor area	1792	Area		Area		Area		Area		Area		Area		Area		Area		Area	
Exposed Ceilings A	A			A		A		A		A		A		A		A		A	
Exposed Ceilings B	B			B		B		B		B		B		B		B		B	
Exposed Floors	Flr			Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr	
Gross Exp Wall A	304																		
Gross Exp Wall B																			
Components	R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
North Shaded	3.15	23.56	11.31																
East/West	3.15	23.56	27.75	9	212	250													
South	3.15	23.56	21.28	3	71	64													
Existing Windows	1.99	37.29	22.15																
Skylight	2.03	36.55	88.23																
Doors	3.01	24.65	3.65																
Net exposed walls A	8.50	8.73	1.29	292		378													
Net exposed walls B	8.50	8.73	1.29																
Exposed Ceilings A	50.00	1.48	0.76																
Exposed Ceilings B	22.86	3.25	1.66																
Exposed Floors	22.05	3.37	0.23																
Foundation Conductive Heatloss	On Grade () or Above ()			10252															
Total Conductive	Heat Loss			10534															
Air Leakage	Heat Loss/Gain	1.0165	0.0683	10708		47													
Ventilation	Case 1		0.11																
	Case 2		25.64																
	Case 3	x	0.06	666		54													
Heat Gain People			239																
Appliances Loads	1 = .25 percent		6685																
Duct and Pipe loss			10%																
Level 1 HL Total	21,908	Total HL for per room		21908															
Level 1 HG Total	1,031	Total HG per room x 1.3			1031														

Level 2				KIT MUD LAUN FAM															
Run ft. exposed wall A	62	A		10	A		50	A		29	A		A		A		A		A
Run ft. exposed wall B	B			B		B		B		B		B		B		B		B	
Ceiling height	11.0			11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0	
Floor area	704	Area		143	Area		308	Area		516	Area		Area		Area		Area		Area
Exposed Ceilings A	A			A		A		A		A		A		A		A		A	
Exposed Ceilings B	B			B		B		B		B		B		B		B		B	
Exposed Floors	Flr			Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr	
Gross Exp Wall A	682			110		550		319											
Gross Exp Wall B																			
Components	R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
North Shaded	3.15	23.56	11.31	13	306	147		10	236	113									
East/West	3.15	23.56	27.75	77	1814	2137		20	471	555	60	1413	1665						
South	3.15	23.56	21.28	22	518	468													
Existing Windows	1.99	37.29	22.15																
Skylight	2.03	36.55	88.23																
Doors	3.01	24.65	3.65	8	197	29		33	813	121									
Net exposed walls A	14.49	5.12	0.76	562	2878	427	110	563	84	487	2494	370	259	1326	197				
Net exposed walls B	8.50	8.73	1.29																
Exposed Ceilings A	50.00	1.48	0.76																
Exposed Ceilings B	22.86	3.25	1.66																
Exposed Floors	22.05	3.37	0.23																
Foundation Conductive Heatloss	On Grade () or Above ()			x															
Total Conductive	Heat Loss			5713				563		4014		2740							
Air Leakage	Heat Loss/Gain	0.4931	0.0683	2817		219		278		6		1158		1861					
Ventilation	Case 1		0.05																
	Case 2		25.64																
	Case 3	x	0.06	361		253		36		7		254		91		173		147	
Heat Gain People			239																
Appliances Loads	1 = .25 percent		6685	1.5		2507				1.5		2507	1.0		1671				
Duct and Pipe loss			10%																
Level 2 HL Total	20,278	Total HL for per room		8891		8042		877		125		6247		4986		4264		4948	
Level 2 HG Total	18,101	Total HG per room x 1.3																	

I review and take responsibility for the design work and am qualified in the appropriate category as an "other designer" under

Division C subsection 3.2.5. of the Building Code. Individual BCIN:

32964



David DaCosta

SB-12 Package

Package J

Total Heat Loss	60,536	btu/h
Total Heat Gain	29,602	btu/h

2012 OBC

Builder: Highcastle Homes

Date: August 5, 2015

Project: Riverwalk Phase 2

Model: 87-3

System 2

Weather Data Brampton 44 -2.2 86 20 48.2

Heat Loss ^T 74.2 deg. F Ht gain ^T 11 deg. F GTA: 7156

Project # PJ-00067
Layout # JB-00856

Level 3

	MAST	WARD	ENS 1	WC	ENS 3	WIC	ENS 6	RETR						
Run ft. exposed wall A	44 A	A	8 A	8 A	17 A	12 A	18 A	29 A	A	A	A	A	A	A
Run ft. exposed wall B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Ceiling height	11.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Floor area	854 Area	161 Area	256 Area	23 Area	84 Area	35 Area	80 Area	308 Area	Area	Area	Area	Area	Area	Area
Exposed Ceilings A	854 A	161 A	256 A	23 A	84 A	35 A	80 A	308 A	A	A	A	A	A	A
Exposed Ceilings B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Exposed Floors	Flr	Flr	Flr	Flr	Flr	35 Flr	80 Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr
Gross Exp Wall A	484		72	72	153	108	162	261						
Gross Exp Wall B														

Components	R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
North Shaded	3.15	23.56	11.31	15	353	170													
East/West	3.15	23.56	27.75	78	1837	2164													
South	3.15	23.56	21.28	15	353	319													
Existing Windows	1.99	37.29	22.15																
Skylight	2.03	36.55	88.23																
Doors	3.01	24.65	3.65																
Net exposed walls A	14.49	5.12	0.76	376	1925	285													
Net exposed walls B	8.50	8.73	1.29																
Exposed Ceilings A	50.00	1.48	0.76	854	1267	649	161	239	122	256	380	195	23	34	17	84	125	64	35
Exposed Ceilings B	22.86	3.25	1.66																
Exposed Floors	22.05	3.37	0.23																
Foundation Conductive Heatloss																			
Total Conductive																			
Air Leakage	Heat Loss/Gain	0.3303	0.0683	1895	245		79	8		357	50		188	22		355	29		239
Ventilation	Case 1		0.04																
	Case 2		25.64																
	Case 3	x	0.06																
Heat Gain People			239	2	362	283		15	10		68	58		36	25		68	33	
Appliances Loads	1 =.25 percent		6685																
Duct and Pipe loss			10%																
Level 3 HL Total	18,350		Total HL for per room	7994			333			1506			793			1497			
Level 3 HG Total	10,470		Total HG per room x 1.3		5971			182			1096				470		631		

Level 4

Run ft. exposed wall A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Run ft. exposed wall B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Ceiling height														
Floor area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area
Exposed Ceilings A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Exposed Ceilings B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Exposed Floors	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr
Gross Exp Wall A														
Gross Exp Wall B														

Components	R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
North Shaded	3.15	23.56	11.31																
East/West	3.15	23.56	27.75																
South	3.15	23.56	21.28																
Existing Windows	1.99	37.29	22.15																
Skylight	2.03	36.55	88.23																
Doors	3.01	24.65	3.65																
Net exposed walls A	14.49	5.12	0.76																
Net exposed walls B	8.50	8.73	1.29																
Exposed Ceilings A	50.00	1.48	0.76																
Exposed Ceilings B	22.86	3.25	1.66																
Exposed Floors	22.05	3.37	0.23																
Foundation Conductive Heatloss																			
Total Conductive																			
Air Leakage	Heat Loss/Gain	0.0000	0.0683																
Ventilation	Case 1		0.00																
	Case 2		25.64																
	Case 3	x	0.06																
Heat Gain People			239																
Appliances Loads	1 =.25 percent		6685																
Duct and Pipe loss			10%																
Level 4 HL Total	0		Total HL for per room																
Level 4 HG Total	0		Total HG per room x 1.3																

I review and take responsibility for the design work and am qualified in the appropriate category as an "other designer" under

Division C subsection 3.2.5. of the Building Code. Individual BCIN:

32964

David DaCosta

David DaCosta

SB-12 Package

Package J

Total Heat Loss	60,536	btu/h
Total Heat Gain	29,602	btu/h

Package: Project: Package J Brampton System: Model: System 2 87-3

Air Leakage Calculations

Building Air Leakage Heat Loss				
B	LRairh	Vb	HL ^{AT}	HL ^{leak}
0.018	0.316	50718	74.2	21416

Building Air Leakage Heat Gain				
B	LRairh	Vb	HG ^{AT}	HG ^{Leak}
0.018	0.092	50718	11	927

Air Leakage Heat Loss/Gain Multiplier Table (Section 11)				
Level	Level Factor (LF)	Building Air	Level Conductive Heat Loss	Air Leakage Heat Loss Multiplier
Level 1	0.5	21416	10534	1.0165
Level 2	0.3		13030	0.4931
Level 3	0.2		12967	0.3303
Level 4	0		0	0.0000

Levels			
1	2	3	4
(LF)	(LF)	(LF)	(LF)
1.0	0.6	0.5	0.4
	0.4	0.3	0.3
		0.2	0.2
			0.1

HG LEAK		Air Leakage Heat Gain	
	927		0.0683
BUILDING CONDUCTIVE HEAT GAIN			13570

Levels this Dwelling	
3	

Ventilation Calculations

Ventilation Heat Loss

Ventilation Heat Loss				
C	PVC	HL ^{AT}	(1-E) HRV	HL ^{bvent}
1.08	90	74.2	0.32	2308

Ventilation Heat Gain

Ventilation Heat Gain			
C	PVC	HG ^{AT}	HG ^{bvent}
1.1	90	11	1069

Case 1

Ventilation Heat Loss (Exhaust only Systems)

Case 1 - Exhaust Only				
Level	LF	HL ^{bvent}	LVL Cond. HL	Multiplier
Level 1	0.5	2308	10534	0.11
Level 2	0.3		13030	0.05
Level 3	0.2		12967	0.04
Level 4	0		0	0.00

Case 1

Ventilation Heat Gain (Exhaust Only Systems)

Case 1 - Exhaust Only		Multiplier	
HG ^{bvent}	1069	0.08	
Building	13570		

Case 2

Ventilation Heat Loss (Direct Ducted Systems)

C	HL ^{AT}	(1-E) HRV	Multiplier
1.08	74.2	0.32	25.64

Case 2

Ventilation Heat Gain (Direct Ducted Systems)

C	HG ^{AT}	Multiplier
1.08	11	11.88

Case 3

Ventilation Heat Loss (Forced Air Systems)

HL ^{bvent}		Multiplier
Total Ventilation Load	2308	0.06

Case 3

Ventilation Heat Gain (Forced Air Systems)

Vent Heat Gain		Multiplier
HG ^{bvent}	HG*1.3	0.08
1069	1	

Foundation Conductive Heatloss Level 1

3005 Watts 10252 Btu/h

Foundation Conductive Heatloss Level 2

Watts Btu/h

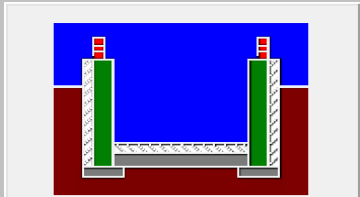
Envelope Air Leakage Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario ▼			
Region:	Brampton ▼			
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				6.4
Type:	Detached ▼			
Number of Stories:	Two ▼			
Foundation:	Full ▼			
House Volume (m ³):	566.3 1436.33			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (ACH=3.57) ▼			
Custom BDT Data:	ELA @ 10 Pa. ▼ 185.83 cm ² 3.57 ACH @ 50 Pa			
Mechanical Ventilation (L/s):	Total Supply:		Total Exhaust:	
	45		45	
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Envelope Air Leakage Rate				
Heating Air Leakage Rate (ACH/H):		0.316		
Cooling Air Leakage Rate (ACH/H):		0.092		

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	▼
Region:	Brampton	▼
Site Description		
Soil Conductivity:	High conductivity: moist soil	▼
Water Table:	Normal (7-10 m, 23-33 Ft)	▼
Foundation Dimensions		
Floor Length (m):	26.08	 Insulation Configuration
Floor Width (m):	6.38	
Exposed Perimeter (m):	46.33	
Wall Height (m):	2.74	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.11	
Door Area (m ²):	0.00	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	29	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		3005

I review and take responsibility for the design work and am qualified in the appropriate category as an "other designer" under Division C subsection 3.2.5. of the Building Code.

Individual BCIN: 32964

David DaCosta

David DaCosta

Package:

Package J

Project:

Brampton

Model:

87-3

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

For systems serving one dwelling unit & conforming to the Ontario Building Code, O.geg 159/93

Location of Installation	
Lot #	Plan #
Township	Brampton
Roll #	Permit #
Address	

Builder	
Name	Highcastle Homes
Address	
City	
Tel	Fax

Installing Contractor	
Name	
Address	
City	
Tel	Fax

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 fireplaces
d)	☐ Solid fuel (including fireplaces)
e)	☐ No combustion Appliances

Heating System	
☒	Forced air
☐	Non forced air
☐	Electric space heat (if over 10% of heat load)

House Type 9.32.3.1(2)	
I	☒ Type a) or b) appliances only, no solid fuel
II	☐ Type I except with solid fuel (including fireplace)
III	☐ Any type c) appliance
IV	☐ Type I or II either electric space heat
Other	☐ Type I, II or IV no forced air

System Design Option	
1	☐ Exhaust only / forced air system
2	☐ HRV WITH DUCTING / forced air system
3	☒ HRV simplified connection to forced air system
4	☐ HRV full ducting/not coupled to forced air system
	☒ Part 6 design

Total Ventilation Capacity 9.32.3.3(1)			
Bsmt & Master Bdrm	2 @ 20 cfm	40 cfm	
Other Bedrooms	4 @ 10 cfm	40 cfm	
Bathrooms & Kitchen	7 @ 10 cfm	70 cfm	
Other rooms	8 @ 10 cfm	80 cfm	
Total		230	

Principal Ventilation Capacity 9.32.3.4(1)			
Master bedroom	1 @ 30 cfm	30 cfm	
Other bedrooms	4 @ 15 cfm	60 cfm	
Total		90	

Principal Exhaust Fan Capacity		
Make	Model	Location
VanEE	60H	Base
107 cfm		Sones

Heat Recovery Ventilator	
Make	VanEE
Model	60H
	107 cfm high
Sensible efficiency @ -25 deg C	55%
Sensible efficiency @ 0 deg C	65%

Supplemental Ventilation Capacity	
Total ventilation capacity	230.0
Less principal exhaust capacity	90.0
REQUIRED supplemental vent. Capacity	140.0 cfm

Supplemental Fans 9.32.3.5.			
Location	cfm	Model	Sones
ENS 1	50	770	2.5
ENS 2	50	770	2.5
ENS 3	50	770	2.5
all fans HVI listed			
Make	Broan	or Equiv.	

Designer Certification			
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.			
Name	David DaCosta		
Signature	<i>David DaCosta</i>		
HRAI #	5190	BCIN #	32964
Date	August 5, 2015		



2985 Drew Road, Suite 202
Mississauga, ON. L4T 0A4
Tel: (905) 671-9800
Fax: (647) 494-9643
dave@gta designs.ca

Residential Mechanical Ventilation Record (W2)

CSA (F326) Mechanical Ventilation

July 6, 2015

Project Information

Project #: JB-00856 Site/Location: Brampton Notes:
Model/Add.: 87-3 Builder/Client: Highcastle Homes

Heating System/ Combustion Appliances	☒ Forced Air	☐ Non-Forced Air	Roll #:	Permit #:	Location				
	☐ Electric	☒ Gas	☐ Oil	☐ Other		Lot & Plan:			
	☐ No Combustion Appliances		No Depressurization Limit			Civic Address:			
	☐ Solid Fuel (Including Fireplace)		5 Pa. Depress. Limit			Name: House ID#:			
Exhaust Equipment	☒ Direct Vent (Sealed Combustion)		No Depressurization Limit		Builder				
	☐ Positive Venting Induced Draft		5 Pa. Depress. Limit			Address: City: P.C.:			
	☐ Natural Draft or B-Vent Atmospheric		5 Pa. Depress. Limit			Phone: Fax:			
	Lowest Depressurization Limit		Pa.			Email Address:			
Total Ventilation Capacity (TVC)	☒ Clothes Dryer(s)		(150 CFM Default)		Designer				
	☐ Downdraft Cook Top		(220 CFM Default)			Name: David DaCosta HRAI #: 5190			
	☐ Other (Exhaust)		(Over 150 CFM)			Address: 2985 Drew Road, Suite 202			
	Depressurization Test/Calc. Required?		☐ Yes	☒ No		City: Mississauga P.C.:			
Exhaust Capacity	Basement & Master Bedroom		2	@	20 CFM	40 CFM	Installation Checklist		
	Other Bedrooms		4	@	10 CFM	40 CFM		Name: David DaCosta HRAI #: 5190	
	Bathrooms & Kitchen		7	@	10 CFM	70 CFM		Address: 2985 Drew Road, Suite 202	
	Other Hab. Rooms		8	@	10 CFM	80 CFM		City: Mississauga P.C.:	
Total Ventilation Capacity (TVC)				230 CFM		Phone: 905-671-9800 Fax: 647-494-9643			
TVC System	Minimum Continuous Exhaust				Measured TVC System				
	Kitchen(s)		@	60 CFM		=	CFM	Email Address: dave@gta designs.ca Other:	
	Bathrooms(s)		@	20 CFM		=	CFM	I certify this ventilation system design to be in accordance with:	
	Total					CFM		☒ CSA F326 M-91	
Additional (Exhaust) Equipment	Minimum Intermittent Exhaust				Installer				
	Kitchen(s)		1	@		100 CFM	=	100 CFM	☐ R-2000
	Bathrooms(s)		6	@		50 CFM	=	300 CFM	Signature: Date: July 6, 2015
	Total					400 CFM		☐ Control Functioning	
Location: Base						☐ Fans Operating and Clean			
Manufacturer/Model: VanEE 60H						☐ Filters Clean			
Design Airflow 107 CFM High 53 CFM Low						☐ Dampers Accessible			
HRV/ERV 65 % Sensible Efficiency @ 0°C						☐ Flow Measuring Stations			
HRV/ERV 55 % Sensible Efficiency @ -25°C						☐ Insulated Ducts Sealed			
Location: Model: CFM: Sones:						☐ Drain Loop and Connection			
Ens 1 770 50 2.5						☐ Label Supply/Exhaust Hood			
Ens 2 770 50 2.5						☐ Distribution to all habitable rooms (non-forced air)			
Ens 3 770 50 2.5						☐ Forced Air System			
Fan Manufacturer: Broan or Equiv.						☐ Contin. Mode			
						☐ Interlocked			
						☐ Kitchen Intake Grease Filter			
						☐ Kitchen Exh. 40 " to Range			
						☐ Exhaust 4" Above Grade			
						☐ Supply 18" above Grade			
						☐ Supply Intake 6' from Exhaust (Recommended)			
						☐ Supply Intake 3' from Exhaust			
						☐ TVC System Supply Airflow Measured			
						CFM High CFM Low			
						☐ TVC System Exhaust Airflow Measured			
						CFM High CFM Low			
						Name: HRAI:			
						Address:			
						City: P.C.:			
						Phone: Fax:			
						Email Address:			
						I Certify this Ventilation System install to be in Accordance with:			
						CSA F326 M-91			
						R-2000			
						Signature: Date:			

Prepared By: David DaCosta	HRAI #: 5190	Model/Address: 87-3
Signature: Date: July 6, 2015	Job #: JB-00856	Official Use:

Project Information

Project #: JB-00856 Site/Location: Brampton Notes:
Model/Add.: 87-3 Builder/Client: Highcastle Homes

Floor Area	Line #									
Total Floor Area: <u>7156</u> ft ²	301									
(Total Heated Floor Area Including Basement; Count Crawl Space as 1/2 actual Area)										
Assumed Air Changes Per Hour at 50 Pascal's										
<table style="width: 100%;"> <tr> <td style="width: 33%;">Tight R-2000 0.5 ACH</td> <td style="width: 33%;">Typical R-2000 1.0 ACH</td> <td style="width: 33%;">Prairies/North (New) 1.0 ACH</td> </tr> <tr> <td>Atlantic (New) 1.5 ACH</td> <td>Other Provinces (New) 1.4 ACH</td> <td>Older Homes 2.5 ACH</td> </tr> <tr> <td>or actual test _____</td> <td></td> <td>House ACH50 <u>1.4</u></td> </tr> </table>	Tight R-2000 0.5 ACH	Typical R-2000 1.0 ACH	Prairies/North (New) 1.0 ACH	Atlantic (New) 1.5 ACH	Other Provinces (New) 1.4 ACH	Older Homes 2.5 ACH	or actual test _____		House ACH50 <u>1.4</u>	302
Tight R-2000 0.5 ACH	Typical R-2000 1.0 ACH	Prairies/North (New) 1.0 ACH								
Atlantic (New) 1.5 ACH	Other Provinces (New) 1.4 ACH	Older Homes 2.5 ACH								
or actual test _____		House ACH50 <u>1.4</u>								
Combustion Appliance Depressurization Limit										
<table style="width: 100%;"> <tr> <td style="width: 33%;">If Spillage Susceptible -5 Pa.</td> <td style="width: 33%;">Flow Factor 0.022</td> <td style="width: 33%;">Depressurization Limit @ TVCC -5 Pa.</td> </tr> <tr> <td>If Non-Spillage Susceptible -10 Pa.</td> <td>Flow Factor 0.037</td> <td></td> </tr> </table>	If Spillage Susceptible -5 Pa.	Flow Factor 0.022	Depressurization Limit @ TVCC -5 Pa.	If Non-Spillage Susceptible -10 Pa.	Flow Factor 0.037		303			
If Spillage Susceptible -5 Pa.	Flow Factor 0.022	Depressurization Limit @ TVCC -5 Pa.								
If Non-Spillage Susceptible -10 Pa.	Flow Factor 0.037									
Flow Factor <u>0.022</u>	304									
Allowable Net Exhaust										
Floor Area (301) <u>7156</u> ft ² x ACH50 (302) <u>1.4</u> x Flow Factor (304) <u>0.022</u> = _____ Allowable Net Exhaust @ TVCC <u>220</u> CFM	305									
Actual Net Exhaust										
TVCC Exhaust <u>230</u> CFM	306									
minus										
TVCC Supply <u>107</u> CFM	307									
Actual Net Exhaust @ TVCC <u>123</u> CFM	308									
Note: If Supply is greater than Exhaust, use worksheet # W-3B										
Required Make-Up Air Flow										
Actual Net Exhaust @ TVCC (Line 308) <u>123</u> CFM										
minus										
Allowable Net Exhaust @ TVCC (Line 305) <u>220</u> CFM										
Required Make-Up Airflow @ TVCC <u>0</u> CFM	309									
At Depressurization Limit (Line 303) <u>-5</u> Pa.										
Description of Make-Up Air System										
Make-Up Air is not Required										
On-Site Depressurization Test	310									
☐ Required ☒ Not Required										

Prepared By: David DaCosta	HRAI #: 5190	Model/Address: 87-3
Signature: 	Date: July 6, 2015	Job #: JB-00856 Official Use:

2985 Drew Road, Suite 202, Mississauga, Ontario L4T 0A4 Tel: 905-671-9800 Fax: 647-494-9643
e-mail dave@gtaDesigns.ca

Page 7
Project # PJ-00067
Layout # JB-00856

This form is used by a designer to demonstrate that the energy efficiency design of a house complies with the building code

For use by Principal Authority

Application No:	Model/Certification Number
-----------------	----------------------------

A. Project Information

Building number, street name	Unit number	Lot/Con
87-3		
Municipality Brampton	Postal code	Reg. Plan number / other description

B. Compliance Option

☒ SB-12 Prescriptive [SB-12 - 2.1.1.]	A B C D E F G H I J K L M or 2.1.1.10 (Additions)	Package J
☐ prescriptive trade-offs used (Specify 2.1.1.2. or 2.1.1.3. sentences being employed):		
☐ SB-12 Performance* [SB-12 - 2.1.2.]	* Attach energy performance calculations using an approved software	
☐ Energy Star®* [SB-12 - 2.1.3.]	* Attach Builder Option Package [BOP] form	
☐ EnerGuide 80® *	* House must be evaluated by NRCAN advisor and meet a rating of 80	

C. Project Design Conditions

Climatic Zone (SB-1):	Heating Equipment	Space Heating Fuel Source
☒ Zone 1 (< 5000 degree days)	☒ ≥ 90% AFUE	☒ Gas ☐ Propane ☐ Solid Fuel
☐ Zone 2 (≥ 5000 degree days)	☐ ≥ 78% < 90% AFUE	☐ Oil ☐ Electric ☐ Earth Energy

Windows+Skylights+Glass Doors	Other Building Conditions
Area of Walls = 598 m ²	☐ ICF Basement ☐ Walkout Basement ☐ Log/Post&Beam
Area of W,S&G = 70 m ²	☐ ICF Above Grade ☐ Slab-on-ground

D. Building Specifications [provide values and ratings of the energy efficiency components proposed, or attach Energy Star BOP form]

Building Component	RSI / R values	Building Component	Efficiency Ratings
Thermal Insulation		Windows & Doors¹	
Ceiling with Attic Space	50	Windows/Sliding Glass Doors	1.8
Ceiling without Attic Space	31	Skylights	2.8
Exposed Floor	31	Mechanicals	
Walls Above Grade	22	Heating Equip.(AFUE or condensing type)	94%
Basement Walls	12	HRV Efficiency (SRE% at 0° C)	60%
Slab (all >600mm below grade)	x	DHW Heater (EF)	0.67
Slab (edge only ≤600mm below grade)	10	DWHR (CSA B55.1 Efficiency)	
Slab (all ≤600mm below grade, or heated)	10		

E. Performance Design Verification [complete applicable sections if SB-12 Performance, Energy Star or EnerGuide80 options used]

SB-12 Performance:

The annual energy consumption using Subsection 2.1.1. SB-12 Package _____ is _____ Gj (1 Gj =1000Mj)

The annual energy consumption of this house as designed is _____ Gj

The software used to simulate the annual energy use of the building is: _____

The building is being designed using an air leakage of _____ air changes per hour @50Pa.

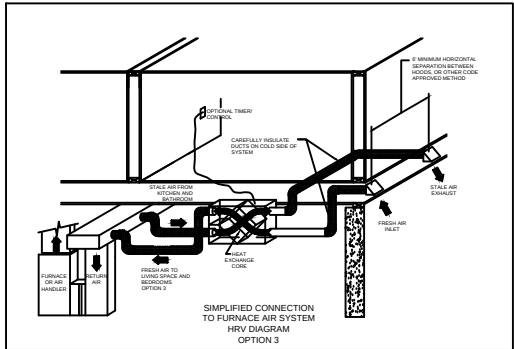
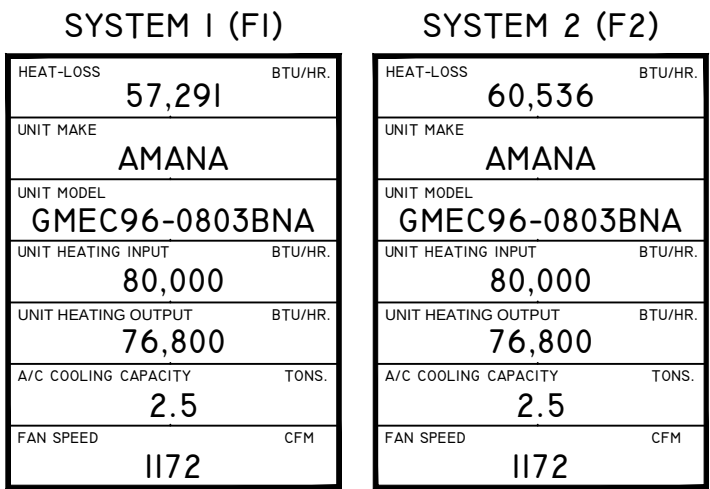
Energy Star: Submit the BOP form with Energy Advisor's certification on completion.

Energy Star and EnerGuide80:

Evaluator/Advisor/Rater Name: _____ Evaluator/Advisor/Rater Licence #: _____

F. House Designer [name & BCIN, if applicable, of person providing information herein to substantiate that design meets building code]

Name David DaCosta	BCIN 32964	Signature 
-----------------------	---------------	--



ALL DUCTWORK
MUST BE SEALED TO
CLASS A LEVEL AS PER
OBC PART 6-6.2.4.3. (11)

FURNACE EQUIPPED WITH
BRUSHLESS DC MOTOR AS
PER OBC 12.3.1.5 (2)

FOR THE PURPOSE OF
HEATLOSS/GAIN
CALCULATIONS ALL
ELEVATIONS HAVE BEEN
CONSIDERED

OBC 2012

ZONE 1 COMPLIANCE
PACKAGE "J" REF. TABLE 2.1.1.2.A

The undersigned has reviewed and takes responsibility for this design on behalf of GTA Designs Inc. and has the qualifications and meets the requirements set out in the Building Code to be a designer

QUALIFICATION INFORMATION

Required unless design is exempt under Division C 3.2.5.1 of the Ontario building code

David Da Costa

B.C.I.N. 32964

Signature of Designer

NOTES

INSTALLATION TO COMPLY WITH
THE LATEST ONTARIO BUILDING
CODE.

ALL SUPPLY OUTLETS TO BE 5" DIA. UNLESS OTHERWISE SPECIFIED.

ALL R/A PARTITIONS 6" (FIRST FLOOR ONLY)

INSULATE DUCTS IN
UNCONDITIONED SPACES R12
UNDERCUT ALL DOORS 1" MIN.

HEATING CONTRACTOR MUST
WORK FROM APPROVED PLANS.
ANY ALTERATIONS TO THIS
ORIGINAL PLAN ARE NOT THE
RESPONSABILITY OF GTA
DESIGNS.

GTA DESIGNS MUST BE
CONSULTED IF KITCHEN
EXHAUST EXCEEDS 700 CFM
DEPRESSURIZATION MAY OCCUR
WITHIN THE DWELLING



2985 DREW ROAD
SUITE 202,
MISSISSAUGA, ONT.
L4T 0A4 TEL: 416-268-6820
-mail: dave@gtadesigns.ca
web: www.gtadesigns.ca

HEAT-LOSS	BTU/HR.
UNIT MAKE	
UNIT MODEL	
UNIT HEATING INPUT	BTU/HR.
UNIT HEATING OUTPUT	BTU/HR.
A/C COOLING CAPACITY	TONS.
FAN SPEED	CFM

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	22	7	7
1ST FLOOR	17	3	2
BASEMENT	10	2	

DATE:

AUGUST 05, 2015

CLIENT:

HIGHCASTLE HOMES

MODEL:

87-3

PROJECT:

RIVERWALK PHASE 2
BRAMPTON, ONT.

SCALE:

$$1/8'' = 1'' - 0''$$

FLOOR PLAN:

BASEMENT

DRAWN BY:	CHECKED:
-----------	----------

AM	DD
----	----

SQFT

LAYOUT NO.

DRAWING NO.

1B-00856

M1

S.A.
R.A.
THERMOSTAT
PRINCIPAL EXHAUST FAN SWITCH
WIR & PRINCIPAL EXHAUST FAN

RETURN AIR GRILLE
(SIZE INDICATED ON DRAWING)
RETURN AIR RISER UP TO
FLOOR ABOVE
RETURN AIR FROM BASEMENT
SECOND FLOOR

DUCT CONNECTION
TO JOIST LINING
RETURN AIR PIPE RISER
RETURN ROUND DUCT

LOWHIGH WALL/KICK SUPPLY DIFFUSER
HRY EXHAUST GRILL
SUPPLY AIR PIPE RISER
VOLUME DAMPER

FLEX DUCT
RIDIT ROUND DUCT
SUPPLY DIFFUSER

The undersigned has reviewed and takes responsibility for this design on behalf of GTA Designs Inc. and has the qualifications and meets the requirements set out in the Building Code to be a designer

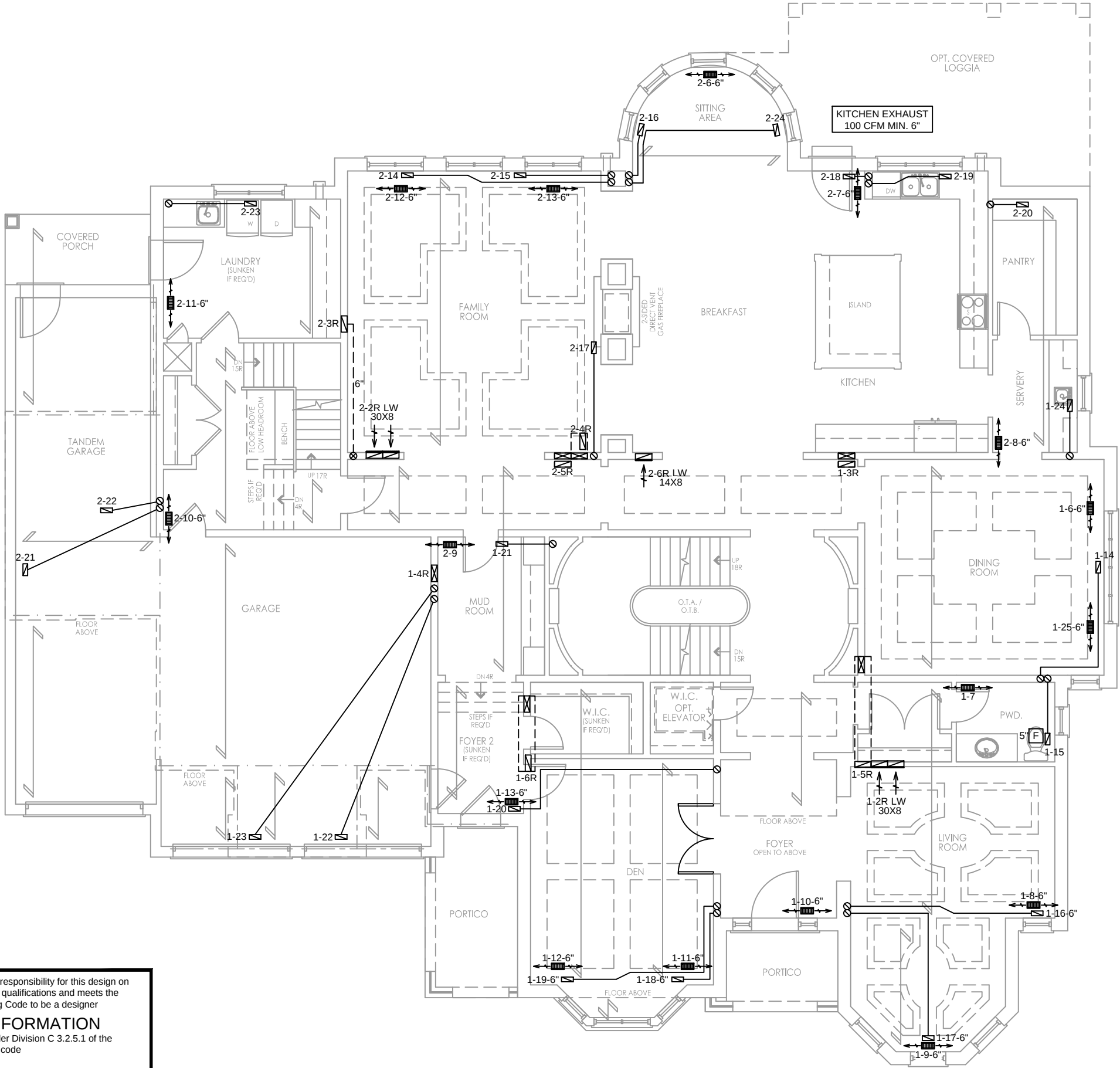
QUALIFICATION INFORMATION

Required unless design is exempt under Division C 3.2.5.1 of the Ontario building code

David Da Costa

Signature of Designer

B.C.I.N. 32964



- CIRCULATION PRINCIPAL FAN SWITCH TO BE CENTRALLY LOCATED
- INSULATE ALL DUCTS IN UNCONDITIONED SPACES MIN. R12
- ALL DUCTWORK MUST BE SEALED TO CLASS A LEVEL AS PER OBC PART 6-6.2.4.3. (11)
- FOR THE PURPOSE OF HEATLOSS/GAIN CALCULATIONS ALL ELEVATIONS HAVE BEEN CONSIDERED

OBC 2012

ZONE 1 COMPLIANCE
PACKAGE "J" REF. TABLE 2.1.1.2.A

NOTES
INSTALLATION TO COMPLY WITH THE LATEST ONTARIO BUILDING CODE.
ALL SUPPLY OUTLETS TO BE 5" DIA. UNLESS OTHERWISE SPECIFIED.
ALL R/A PARTITIONS 6" (FIRST FLOOR ONLY)
INSULATE DUCTS IN UNCONDITIONED SPACES R12 UNDERCUT ALL DOORS 1" MIN.
HEATING CONTRACTOR MUST WORK FROM APPROVED PLANS. ANY ALTERATIONS TO THIS ORIGINAL PLAN ARE NOT THE RESPONSABILITY OF GTA DESIGNS.
GTA DESIGNS MUST BE CONSULTED IF KITCHEN EXHAUST EXCEEDS 700 CFM DEPRESSURIZATION MAY OCCUR WITHIN THE DWELLING



2985 DREW ROAD
SUITE 202,
MISSISSAUGA, ONT.
L4T 0A4 TEL: 416-268-6820
e-mail: dave@gtadesigns.ca
web: www.gtadesigns.ca

HEAT-LOSS	BTU/HR.		
UNIT MAKE			
UNIT MODEL			
UNIT HEATING INPUT	BTU/HR.		
UNIT HEATING OUTPUT	BTU/HR.		
A/C COOLING CAPACITY	TONS.		
FAN SPEED	CFM		
# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	22	7	7
1ST FLOOR	17	3	2
BASEMENT	10	2	

DATE:
AUGUST 05, 2015

CLIENT:
HIGHCASTLE HOMES

MODEL:
87-3

PROJECT:
RIVERWALK PHASE 2
BRAMPTON,ONT.

SCALE:
1/8" = 1'-0"

FLOOR PLAN:
GROUND FLOOR

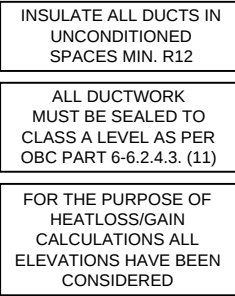
DRAWN BY: AM

CHECKED: DD

SQFT: 7156

LAYOUT NO. JB-00856

DRAWING NO. M2



ZONE 1 COMPLIANCE
PACKAGE "J" REF. TABLE 2.1.1.2.A

 **gtaDesigns**
2985 DREW ROAD
SUITE 202,
MISSISSAUGA, ONT.
L4T 0A4 TEL: 416-268-6820
e-mail: dave@gtadesigns.ca
web: www.gtadesigns.ca

DATE: AUGUST 05, 2015		
CLIENT: HIGHCASTLE HOMES		
MODEL: 87-3		
PROJECT: RIVERWALK PHASE 2 BRAMPTON, ONT.		
SCALE: 1/8" = 1'-0"		
FLOOR PLAN: SECOND FLOOR		
DRAWN BY: AM	CHECKED: DD	SOFT 7156
LAYOUT NO. JB-00856		DRAWING NO. M3

The diagram shows three Feynman diagrams for the decay of a Z boson into a photon and a gluon. The first diagram shows a Z boson (wavy line) decaying into a photon (wavy line) and a gluon (curly line). The second diagram shows a Z boson (wavy line) decaying into a photon (wavy line) and a gluon (curly line). The third diagram shows a Z boson (wavy line) decaying into a photon (wavy line) and a gluon (curly line).

David Da Costa  B.C.I.N. 32964
Signature of Designer