

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 87-2-C-WOD Lot 12			Lot: 12
Municipality Brampton			Postal code
Plan number/ other description			Lot/con.
B. Individual who reviews and takes responsibility for design activities			
Name David DaCosta		Firm gtaDesigns Inc.	
Street address 2985 Drew Road, Suite 202		Unit no.	Lot/con.
Municipality Mississauga	Postal code L4T 0A4	Province Ontario	E-mail dave@gtadesigns.ca
Telephone number (905) 671-9800	Fax number (647) 494-9643	Cell number (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	
Heating and Cooling Load Calculations Air System Design Residential mechanical ventilation Design Summary Residential System Design per CAN/CSA-F280-12 Residential New Construction - Forced Air		Project #:	PJ-00067
		Layout #:	JB-02491
		Builder	Highcastle Homes
		Project	Riverwalk Phase 2
		Model	87-2-C-WOD Lot 12
		SB-12	Package J
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: 1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
<u>August 17, 2016</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-02491	
Building Location					
Address (Model): 87-2-C-WOD Lot 12			Site: Riverwalk Phase 2		
Model:			Lot: 12		
City and Province: Brampton			Postal code:		
Calculations based on					
Dimensional information based on: Highcastle Homes					
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: Sheltered		
HRV? VanEE		60H	Internal shading: Light-translucent		Occupants: 7
Sensible Eff. at -25C 55%		Apparent Effect. at -0C 68%	Units: Imperial		Area Sq ft: 6402
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		

SB-12 Package J

Builder: **Highcastle Homes**

Date: **August 17, 2016**

Project: **Riverwalk Phase 2**

Model: **87-2-C-WOD Lot 12**

System 1

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

Project # **PJ-00067**
Layout # **JB-02491**

Page 3

DESIGN LOAD SPECIFICATIONS		AIR DISTRIBUTION & PRESSURE		FURNACE/AIR HANDLER DATA:		BOILER/WATER HEATER DATA:		A/C UNIT DATA:	
Level 1 Net Load	19,149 btu/h	Equipment External Static Pressure	0.5 "w.c.	Make	Amana	Make	Type	Amana	2.5 Ton
Level 2 Net Load	16,014 btu/h	Additional Equipment Pressure Drop	0.225 "w.c.	Model	GMEC96-0803BNA	Model		Cond.-----	2.5
Level 3 Net Load	21,498 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	56,661 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	28,452 btu/h	S/A Plenum Pressure	0.14 "w.c.	Water Temp	deg. F.	Blower DATA:			
Combo System HL + 10%	62,327 Btu/h	Heating Air Flow Proportioning Factor	0.0207 cfm/btuh	AFUE	96%	Blower Speed Selected:	W2	Blower Type	ECM
Building Volume Vb	38008 ft³	Cooling Air Flow Proportioning Factor	0.0369 cfm/btuh	Aux. Heat				(Brushless DC OBC 12.3.1.5.(2))	
Ventilation Load	4,176 Btu/h.	R/A Temp	70 deg. F.	SB-12 Package	Package J	Heating Check	1172 cfm	Cooling Check	1049 cfm
Ventilation PVC	111.3 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									DEN	DEN	PWD	FOY	LIV	LIV	LIV	DIN					
Btu/Outlet	3830	3830	3830	3830	3830									3163	3163	741	2376	1624	1624	1624	1698					
Heating Airflow Rate CFM	79	79	79	79	79									65	65	15	49	34	34	34	35					
Cooling Airflow Rate CFM	7	7	7	7	7									69	69	11	40	87	87	87	39					
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	22	21	44	18	28									55	45	45	38	28	22	26	5					
Equivalent Length	70	120	70	100	100	70	70	70	70	70	70	70	70	130	100	130	70	100	80	90	110	70	70	70	70	
Total Effective Length	92	141	114	118	128	70	70	70	70	70	70	70	70	185	145	175	108	128	102	116	115	70	70	70	70	
Adjusted Pressure	0.14	0.09	0.11	0.11	0.10	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.07	0.09	0.07	0.12	0.10	0.13	0.11	0.11	0.19	0.19	0.19	0.19	
Duct Size Round	6	6	6	6	6									6	5	3	5	6	6	6	4					
Outlet Size	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	3x10	3x10	3x10	4x10	4x10	4x10	3x10	4x10	4x10	4x10	4x10	
Trunk	D	B	A	B	D									B	B	A	B	C	C	C	D					

	Level 3										Level 4														
S/A Outlet No.	14	15	16	17	18	19	20	21	22																
Room Use	BED 4	BED 4	ENS 4	BED 5	BED 5	BED 5	ENS 5	BED 2	BED 2																
Btu/Outlet	3100	3100	794	2279	2279	2279	94	3787	3787																
Heating Airflow Rate CFM	64	64	16	47	47	47	2	78	78																
Cooling Airflow Rate CFM	83	83	13	72	72	72	2	64	64																
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	64	54	52	46	54	66	40	26	32																
Equivalent Length	130	110	120	130	155	165	120	120	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Total Effective Length	194	164	172	176	209	231	160	146	122	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Adjusted Pressure	0.07	0.08	0.08	0.07	0.06	0.06	0.08	0.09	0.11	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Duct Size Round	6	6	3	6	6	6	2	6	6																
Outlet Size	4x10	4x10	3x10	4x10	4x10	4x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10
Trunk	A	A	A	C	C	C	D	D	D																

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	210	245	243	158	158	158					
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	9	20	32	40	40	25					
Equivalent Length	110	150	160	185	150	185	50	50	50	50	50
Total Effective Length	119	170	192	225	190	210	50	50	50	50	50
Adjusted Pressure	0.10	0.07	0.06	0.05	0.06	0.06	0.24	0.24	0.24	0.24	0.24
Duct Size Round	8.0	9.0	9.5	8.5	8.0	8.0					
Inlet Size	FLC	8	8	8	8	8					
" "	x	x	x	x	x	x	x	x	x	x	x
Inlet Size	9X6	14	14	14	14	14					
Trunk	Z	Z				Z					

Return Trunk Duct Sizing	Trunk	CFM	Press.	Round	Rect. Size
Drop		1172	0.05	17.0	24x12
Z		613	0.06	13.0	18x8 14x10
Y					
X					
W					
V					
U					
T					
S					
R					
Q					

Supply Trunk Duct Sizing	Trunk	CFM	Press.	Round	Rect. Size
A		819	0.06	14.5	24x8 18x10
B		580	0.06	12.5	18x8 14x10
C		242	0.06	9.5	10x8 12x7
D		352	0.08	10.0	12x8 10x10
E					
F					
G					
H					
I					
J					
K					

2012 OBC

Builder: Highcastle Homes

Date: August 17, 2016

Project: Riverwalk Phase 2

Model: 87-2-C-WOD Lot 12

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: 6402

Project # PJ-00067
Layout # JB-02491

Level 1

BASE

Run ft. exposed wall A	102	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	4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG
Floor area	1159	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	408													
Gross Exp Wall B														

Components	R-Values	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	3	71	64											
WOB Windows	3.15	23.56	28.32														
Skylight	2.03	36.55	88.23														
Doors	3.01	24.65	3.65	21	518	77											
Net exposed walls A	8.50	8.73	1.29	384		497											
Net exposed walls B	14.49	5.12	0.76														
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 ()			9243													
Total Conductive	Heat Loss			9831													
	Heat Gain				638												
Air Leakage	Heat Loss/Gain	0.8687	0.0533	8540		34											
Ventilation	Case 1		0.15														
	Case 2		25.64														
	Case 3	x	0.08														
Heat Gain People			239														
Appliances Loads	1 = 25 percent		5017														
Duct and Pipe loss			10%														
Level 1 HL Total	19,149		Total HL per room	19149													
Level 1 HG Total	952		Total HG per room x 1.3		952												

Level 2

DEN

PWD

FOY

LIV

DIN

Run ft. exposed wall A	43	A	6	A	10	A	33	A	19	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	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	351	Area	66	Area	177	Area	297	Area	338	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	A	A	A
Exposed Ceilings B	B	B	B	B	B	B	10	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	Flr	Flr	Flr
Gross Exp Wall A	473		66		110		363		209								
Gross Exp Wall B																	

Components	R-Values	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	34	801	943											
Existing Windows	1.99	37.29	22.15														
Skylight	2.03	36.55	88.23														
Doors	3.01	24.65	3.65	48	1183	175											
Net exposed walls A	14.49	5.12	0.76	391	2002	297	59	302	45	61	312	46	299	1531	227	209	1070
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			3986				467		1497			3071			1070	
	Heat Gain				1416			194		731			2019			159	
Air Leakage	Heat Loss/Gain	0.5077	0.0533	2024		75		237		10			1559		108	543	
Ventilation	Case 1		0.08														
	Case 2		25.64														
	Case 3	x	0.08														
Heat Gain People			239														
Appliances Loads	1 = 25 percent		5017														
Duct and Pipe loss			10%														
Level 2 HL Total	16,014		Total HL per room	6326				741		2376			4873			1698	
Level 2 HG Total	13,269		Total HG per room x 1.3		3744			289		1092			7091			1052	

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

Dave DaCosta

Dave DaCosta

SB-12 Package

Package J

Total Heat Loss	56,661	btu/h
Total Heat Gain	28,452	btu/h

2012 OBC	Builder: Highcastle Homes	Date: August 17, 2016	System 1	Weather Data	Brampton	44	-2.2	86	20	48.2	Project #	PJ-00067
	Project: Riverwalk Phase 2	Model: 87-2-C-WOD Lot 12		Heat Loss ^T	74.2 deg. F	Ht gain ^T	11 deg. F	GTA:	6402	Layout #	JB-02491	JB-02491

Level 3				BED 4		ENS 4		BED 5		ENS 5		BED 2		A		A		A		A		A		A	
Run ft. exposed wall A				50	A	9	A	47	A	A		51	A	A	B	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	B	B	B	B	B	B
Ceiling height				10.0		9.0		10.0		9.0		10.0		9.0		9.0		9.0		9.0		9.0		9.0	
Floor area				518	Area	48	Area	532	Area	49	Area	415	Area	Area		Area		Area		Area		Area		Area	
Exposed Ceilings A				518	A	48	A	532	A	49	A	415	A	A	B	A	B	A	B	A	B	A	B	A	B
Exposed Ceilings B					B		B		B	B			B	B	B	B	B	B	B	B	B	B	B	B	B
Exposed Floors					Flr		Flr		Flr	Flr		405	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr
Gross Exp Wall A				500		81		470				510													
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	Loss	Gain	Loss	Gain
North Shaded	3.15	23.56	11.31																						
East/West	3.15	23.56	27.75	60	1413	1665		94	2214	2608		42	989	1165											
South	3.15	23.56	21.28	20	471	426	7	165	149	20	471	426													
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	420	2151	319	74	379	56	356	1823	270	468	2397	355										
Net exposed walls B	8.50	8.73	1.29																						
Exposed Ceilings A	50.00	1.48	0.76	518	769	394	48	71	36	532	789	404	49	73	37	415	616	315							
Exposed Ceilings B	22.86	3.25	1.66																						
Exposed Floors	22.05	3.37	0.23										405	1363	92										
Foundation Conductive Heatloss																									
Total Conductive	Heat Loss				4804				615		5298		73		5365										
	Heat Gain					2803			242		3708		37		1928										
Air Leakage	Heat Loss/Gain	0.2115	0.0533		1016	149			130	13	1120	198	15	2	1134	103									
Ventilation	Case 1		0.04	0.10																					
	Case 2		25.64	11.88																					
	Case 3	x	0.08	0.10																					
Heat Gain People																									
Appliances Loads																									
Duct and Pipe loss																									
Level 3 HL Total	21,498				6200				794		6837		94		7573										
Level 3 HG Total	14,231					4496			361		5848		56		3471										

Level 4				A		A		A		A		A		A		A		A		A		A		A	
Run ft. exposed wall 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	
Ceiling height																									
Floor 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	
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																									
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	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	0.0533																						
Ventilation	Case 1		0.00	0.10																					
	Case 2		25.64	11.88																					
	Case 3	x	0.08	0.10																					
Heat Gain People																									
Appliances Loads																									
Duct and Pipe loss																									
Level 4 HL Total	0																								
Level 4 HG Total	0																								

Total Heat Loss	56,661	btu/h
Total Heat Gain	28,452	btu/h

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

Package: Package J System: System 1
Project: Brampton Model: 87-2-C-WOD Lot 12

Air Leakage Calculations

Air Leakage Calculations																																																																
<table><tr><th colspan="5">Building Air Leakage Heat Loss</th></tr><tr><th>B</th><th>LRairh</th><th>Vb</th><th>HL^T</th><th>HLleak</th></tr><tr><td>0.018</td><td>0.336</td><td>38008</td><td>74.2</td><td>17080</td></tr></table>					Building Air Leakage Heat Loss					B	LRairh	Vb	HL^T	HLleak	0.018	0.336	38008	74.2	17080	<table><tr><th colspan="5">Building Air Leakage Heat Gain</th></tr><tr><th>B</th><th>LRairh</th><th>Vb</th><th>HG^T</th><th>HG Leak</th></tr><tr><td>0.018</td><td>0.098</td><td>38008</td><td>11</td><td>739</td></tr></table>					Building Air Leakage Heat Gain					B	LRairh	Vb	HG^T	HG Leak	0.018	0.098	38008	11	739																									
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Air Leakage Heat Loss/Gain Multiplier Table (Section 11)																																																																
Level	Level Factor (LF)	Building Air	Level Conductive Heat Loss	Air Leakage Heat Loss Multiplier																																																												
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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																																																													
<table><tr><th colspan="2"></th><th colspan="3">Air Leakage Heat Gain</th></tr><tr><td colspan="2">HG LEAK</td><td colspan="2">739</td><td rowspan="2">0.0533</td></tr><tr><td colspan="2">BUILDING CONDUCTIVE HEAT GAIN</td><td colspan="2">13874</td></tr></table>							Air Leakage Heat Gain			HG LEAK		739		0.0533	BUILDING CONDUCTIVE HEAT GAIN		13874		<table><tr><th colspan="4">Levels this Dwelling</th></tr><tr><td colspan="4">3</td></tr></table>					Levels this Dwelling				3																																				
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HG LEAK		739		0.0533																																																												
BUILDING CONDUCTIVE HEAT GAIN		13874																																																														
Levels this Dwelling																																																																
3																																																																

Ventilation Calculations

Vent	Ventilation Heat Loss					Ventilation Heat Gain				Vent
	Ventilation Heat Loss					Ventilation Heat Gain				
	C	PVC	HL^T	(1-E) HRV	HLbvent	C	PVC	HG^T	HGbvent	
	1.08	111.3	74.2	0.32	2854	1.1	111.3	11	1322	
Case 1						Case 1				
Case 1	Ventilation Heat Loss (Exhaust only Systems)					Ventilation Heat Gain (Exhaust Only Systems)				Case 1
	Case 1 - Exhaust Only					Case 1 - Exhaust Only		Multiplier		
	Level	LF	HLbvent	LVL Cond. HL	Multiplier	HGbvent	1322	0.10		
	Level 1	0.5	2854	9831	0.15	Building	13874			
	Level 2	0.3		10092	0.08					
Level 3	0.2	16154		0.04						
Level 4	0	0		0.00						
Case 2						Case 2				
Case 2	Ventilation Heat Loss (Direct Ducted Systems)					Ventilation Heat Gain (Direct Ducted Systems)				Case 2
				Multiplier				Multiplier		
	C	HL^T	(1-E) HRV	25.64		C	HG^T	11.88		
	1.08	74.2	0.32			1.08	11			
Case 3						Case 3				
Case 3	Ventilation Heat Loss (Forced Air Systems)					Ventilation Heat Gain (Forced Air Systems)				Case 3
			HLbvent	Multiplier				Vent Heat Gain	Multiplier	
	Total Ventilation Load		2854	0.08		HGbvent	HG*1.3	1322	0.10	
						1322	1			

Foundation Conductive Heatloss Level 1

2709

Watts

9243

Btu/h

Foundation Conductive Heatloss Level 2

Watts

Btu/h

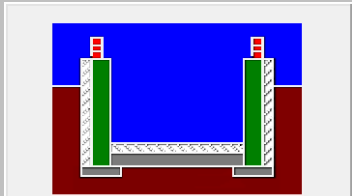
Envelope Air Leakage Calculator

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):	7.32			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1076.39			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (ACH=3.57)			
Custom BDT Data:	ELA @ 10 Pa. ▼ 322.44 cm ²			
	3.57 ACH @ 50 Pa			
Mechanical Ventilation (L/s):	Total Supply:		Total Exhaust:	
	55.65		55.65	
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Heating Air Leakage Rate (ACH/H):		0.336		
Cooling Air Leakage Rate (ACH/H):		0.098		

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):	17.69	 Insulation Configuration
Floor Width (m):	6.09	
Exposed Perimeter (m):	31.09	
Wall Height (m):	2.74	
Depth Below Grade (m):	1.52	
Window Area (m ²):	0.28	
Door Area (m ²):	1.95	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		2709

Builder: **Highcastle Homes**

Date: **August 17, 2016**

Project: **Riverwalk Phase 2**

Model: **87-2-C-WOD Lot 12**

System 2

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

Project # **PJ-00067**
Layout # **JB-02491**

Page 3

DESIGN LOAD SPECIFICATIONS		AIR DISTRIBUTION & PRESSURE		FURNACE/AIR HANDLER DATA:		BOILER/WATER HEATER DATA:		A/C UNIT DATA:	
Level 1 Net Load	24,526 btu/h	Equipment External Static Pressure	0.5 "w.c.	Make	Amana	Make	Type	Amana	2.5 Ton
Level 2 Net Load	18,821 btu/h	Additional Equipment Pressure Drop	0.225 "w.c.	Model	GMEC96-0803BNA	Model		Cond.-----	2.5
Level 3 Net Load	14,766 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	58,113 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	28,223 btu/h	S/A Plenum Pressure	0.14 "w.c.	Water Temp	deg. F.	Blower DATA:			
Combo System HL + 10%	63,924 Btu/h	Heating Air Flow Proportioning Factor	0.0202 cfm/btuh	AFUE	96%	Blower Speed Selected:	W2	Blower Type	ECM
Building Volume Vb	43336 ft³	Cooling Air Flow Proportioning Factor	0.0372 cfm/btuh	Aux. Heat				(Brushless DC OBC 12.3.1.5.(2))	
Ventilation Load	4,176 Btu/h.	R/A Temp	70 deg. F.	SB-12 Package	Package J	Heating Check	1172 cfm	Cooling Check	1049 cfm
Ventilation PVC	111.3 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	21									6	7	8	9	10	11	12								
Room Use	BASE	BASE	BASE	BASE	BASE	STAIR									KIT	KIT	FAM	FAM	FAM	MUD	LAUN								
Btu/Outlet	4308	4308	4308	4308	4308	2984									3011	3011	2212	2212	2212	2703	3457								
Heating Airflow Rate CFM	87	87	87	87	87	60									61	61	45	45	45	55	70								
Cooling Airflow Rate CFM	36	36	36	36	36	6									84	84	89	89	89	14	76								
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			
Actual Duct Length	12	26	46	39	59	60									41	53	52	68	58	10	16								
Equivalent Length	110	80	110	100	110	120	70	70	70	70	70	70	70	70	130	90	130	90	80	100	80	70	70	70	70	70			
Total Effective Length	122	106	156	139	169	180	70	70	70	70	70	70	70	70	171	143	182	158	138	110	96	70	70	70	70	70			
Adjusted Pressure	0.11	0.12	0.08	0.09	0.08	0.07	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.08	0.09	0.07	0.08	0.09	0.12	0.14	0.19	0.19	0.19	0.19	0.19			
Duct Size Round	6	6	6	6	6	5									6	6	6	6	6	5	5								
Outlet Size	4x10	4x10	4x10	4x10	4x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	3x10	3x10	4x10	4x10	4x10	4x10	4x10			
Trunk	A	A	B	B	C	C									B	B	C	C	C	A	A								

	Level 3										Level 4															
S/A Outlet No.	13	14	15	16	17	18	19	20																		
Room Use	MAST	MAST	BED 3	ENS 3	ENS 2	BED 6	WC	ENS																		
Btu/Outlet	2202	2202	2693	1329	768	3248	722	1601																		
Heating Airflow Rate CFM	44	44	54	27	15	65	15	32																		
Cooling Airflow Rate CFM	62	62	68	19	6	65	14	44																		
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	62	70	72	83	27	27	42	51																		
Equivalent Length	140	120	90	120	150	170	110	90	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
Total Effective Length	202	190	162	203	177	197	152	141	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
Adjusted Pressure	0.06	0.07	0.08	0.06	0.07	0.07	0.09	0.09	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	
Duct Size Round	6	6	6	4	3	6	3	5																		
Outlet Size	4x10	4x10	4x10	3x10	3x10	4x10	3x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	
Trunk	B	B	B	C	A	A	A	A																		

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	250	448	158	158	158						
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	48	25	57	61						
Equivalent Length	110	155	105	150	180	50	50	50	50	50	50
Total Effective Length	120	203	130	207	241	50	50	50	50	50	50
Adjusted Pressure	0.10	0.06	0.09	0.06	0.05	0.24	0.24	0.24	0.24	0.24	0.24
Duct Size Round	8.0	11.5	7.5	8.0	8.5						
Inlet Size	FLC	8	8	8	8						
" "	x	x	x	x	x	x	x	x	x	x	x
Inlet Size	9X6	30	14	14	14						
Trunk	Z	Y	Z	Y	Y						

Return Trunk Duct Sizing				
Trunk	CFM	Press.	Round	Rect. Size
Drop	1172	0.05	17.0	24x12
Z	1172	0.05	17.0	26x10 22x12
Y	764	0.05	14.5	24x8 18x10
X				
W				
V				
U				
T				
S				
R				
Q				

Supply Trunk Duct Sizing				
Trunk	CFM	Press.	Round	Rect. Size
A	1172	0.06	16.5	32x8 24x10
B	746	0.06	14.0	22x8 18x10
C	308	0.06	10.0	12x8 10x10
D				
E				
F				
G				
H				
I				
J				
K				

2012 OBC	Builder: Highcastle Homes	Date: August 17, 2016	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: 6402	Project # PJ-00067	Layout # JB-02491
	Project: Riverwalk Phase 2	Model: 87-2-C-WOD Lot 12							

Level 1				BASE		STAIR		A		A		A		A		A		A		A		A	
Run ft. exposed wall A				130	A	20	A	A	B	A	B	A	B	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
Ceiling height				4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG	4.0	AG
Floor area				1274	Area	249	Area	Area	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	
Exposed Ceilings B				B		B		B		B		B		B		B		B		B		B	
Exposed Floors				Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr	
Gross Exp Wall A				520		80																	
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	Loss	Gain
North Shaded	3.15	23.56	11.31																				
East/West	3.15	23.56	27.75	44	1036	1221																	
South	3.15	23.56	21.28	6	141	128																	
WOB Windows	3.15	23.56	28.32																				
Skylight	2.03	36.55	88.23																				
Doors	3.01	24.65	3.65																				
Net exposed walls A	8.50	8.73	1.29	470		608	80		104														
Net exposed walls B	14.49	5.12	0.76																				
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 ()																						
Total Conductive	Heat Loss				10645				1638														
	Heat Gain				11823				1638														
Air Leakage	Heat Loss/Gain	0.7412	0.0665		8763	130		1214	7														
Ventilation	Case 1	0.11	0.10																				
	Case 2	25.64	11.88																				
	Case 3	x	0.08	0.10																			
Heat Gain People			239																				
Appliances Loads	1 = 25 percent		5710	1.0		1427																	
Duct and Pipe loss			10%																				
Level 1 HL Total	24,526	Total HL for per room			21542		2984																
Level 1 HG Total	4,988	Total HG per room x 1.3				4830		157															

Level 2				KIT		FAM		MUD		LAUN		A		A		A		A		A		A	
Run ft. exposed wall A				37	A	51	A	23	A	29	A	A	B	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
Ceiling height				11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0		11.0	
Floor area				658	Area	509	Area	122	Area	147	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area
Exposed Ceilings A				A		4	A	A		A		A		A		A		A		A		A	
Exposed Ceilings B				B		B		B		B		B		B		B		B		B		B	
Exposed Floors				Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr		Flr	
Gross Exp Wall A				407		561		253		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	Loss	Gain	Loss	Gain
North Shaded	3.15	23.56	11.31																				
East/West	3.15	23.56	27.75	74	1743	2053	60	1413	1665	17	400	472											
South	3.15	23.56	21.28				11	259	234														
Existing Windows	1.99	37.29	22.15																				
Skylight	2.03	36.55	88.23																				
Doors	3.01	24.65	3.65	18	444	66				21	518	77	12	296	44								
Net exposed walls A	14.49	5.12	0.76	315	1613	239	490	2509	372	232	1188	176	290	1485	220								
Net exposed walls B	8.50	8.73	1.29																				
Exposed Ceilings A	50.00	1.48	0.76				4	6	3														
Exposed Ceilings B	22.86	3.25	1.66																				
Exposed Floors	22.05	3.37	0.23																				
Foundation Conductive Heatloss	On Grade () or Above ()																						
Total Conductive	Heat Loss				3800				4188			1706		2181									
	Heat Gain					2358			2274			253		736									
Air Leakage	Heat Loss/Gain	0.5041	0.0665		1916	157		2111	151		860	17	1100	49									
Ventilation	Case 1	0.07	0.10																				
	Case 2	25.64	11.88																				
	Case 3	x	0.08	0.10																			
Heat Gain People			239																				
Appliances Loads	1 = 25 percent		5710	0.5		714	2.0		2855			0.5		714									
Duct and Pipe loss			10%																				
Level 2 HL Total	18,821	Total HL for per room			6023			6637			2703		3457		2046								
Level 2 HG Total	14,111	Total HG per room x 1.3				4513			7168			384											

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

Dave DaCosta

Dave DaCosta

SB-12 Package

Package J

Total Heat Loss	58,113	btu/h
Total Heat Gain	28,223	btu/h

2012 OBC	Builder: Highcastle Homes	Date: August 17, 2016	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: 6402	Project # PJ-00067	Layout # JB-02491
	Project: Riverwalk Phase 2	Model: 87-2-C-WOD Lot 12															

Level 3				MAST		BED 3		ENS 3		ENS 2		BED 6		WC		ENS													
Run ft. exposed wall A				24	A	21	A	15	A	8	A	27	A	7	A	9	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	B	B	B	B	
Ceiling height				10.0		9.0		9.0		9.0		10.0		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				679	Area	275	Area	52	Area	67	Area	252	Area	24	Area	188	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	
Exposed Ceilings A				679	A	275	A	52	A	67	A	252	A	24	A	188	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	B	B	B	B	
Exposed Floors				Flr		Flr		Flr		15	Flr	20	Flr	Flr		Flr		Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	
Gross Exp Wall A				240		189		135		72		270		63		81													
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	Loss	Gain	Loss	Gain	
North Shaded				3.15	23.56	11.31	40	942	1110	24	565	666	7	165	194	20	471	555	7	165	194	21	495	583					
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	200	1024	152	165	845	125	128	655	97	72	369	55	250	1280	190	56	287	43	60	307	46		
Net exposed walls B				8.50	8.73	1.29																							
Exposed Ceilings A				50.00	1.48	0.76	679	1008	516	275	408	209	52	77	40	67	99	51	252	374	192	24	36	18	188	279	143		
Exposed Ceilings B				22.86	3.25	1.66																							
Exposed Floors				22.05	3.37	0.23																							
Foundation Conductive Heatloss																													
Total Conductive		Heat Loss					2974			1818		898		519		2193		487		1081									
		Heat Gain						1778		1000		331		109		941		255		771									
Air Leakage		Heat Loss/Gain		0.4003	0.0665	1191	118		728	67	359	22	208	7	878	63	195	17	433	51									
Ventilation		Case 1			0.06																								
		Case 2			25.64	11.88																							
		Case 3		x	0.08	0.10																							
Heat Gain People						239	2	240	183	1	147	103	73	34	42	11	177	97	39	26	87	79							
Appliances Loads				1 =.25 percent		5710																							
Duct and Pipe loss						10%																							
Level 3 HL Total		14,766		Total HL for per room				4405			2693		1329		768		3248		722		1601								
Level 3 HG Total		9,124		Total HG per room x 1.3					3324			1831		503		166			1741										

Level 4				A		A		A		A		A		A		A		A		A		A		A		A	
Run ft. exposed wall 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	
Ceiling height																											
Floor 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	
Exposed Ceilings 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	
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	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	0.0665																								
Ventilation	Case 1		0.00																								
	Case 2		25.64																								
	Case 3	x	0.08																								
Heat Gain People			239																								
Appliances Loads	1 =.25 percent		5710																								
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																								

Total Heat Loss	58,113	btu/h
Total Heat Gain	28,223	btu/h

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

Package: Project: Package J Brampton System: Model: System 2 87-2-C-WOD Lot 12

Air Leakage Calculations

Building Air Leakage Heat Loss				
B	LRairh	Vb	HL^T	HLleak
0.018	0.345	43336	74.2	19954

Building Air Leakage Heat Gain				
B	LRairh	Vb	HG^T	HG Leak
0.018	0.100	43336	11	856

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	19954	13461	0.7412
Level 2	0.3		11874	0.5041
Level 3	0.2		9969	0.4003
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	
	856		0.0665
BUILDING CONDUCTIVE HEAT GAIN		12866	

Levels this Dwelling	
3	

Ventilation Calculations

Ventilation Heat Loss

Ventilation Heat Loss				
C	PVC	HL^T	(1-E) HRV	HLbvent
1.08	111.3	74.2	0.32	2854

Ventilation Heat Gain

Ventilation Heat Gain			
C	PVC	HG^T	HGbvent
1.1	111.3	11	1322

Case 1

Ventilation Heat Loss (Exhaust only Systems)

Case 1 - Exhaust Only				
Level	LF	HLbvent	LVL Cond. HL	Multiplier
Level 1	0.5	2854	13461	0.11
Level 2	0.3		11874	0.07
Level 3	0.2		9969	0.06
Level 4	0		0	0.00

Case 1

Ventilation Heat Gain (Exhaust Only Systems)

Case 1 - Exhaust Only		Multiplier	
HGbvent	1322	0.10	
Building	12866		

Case 2

Ventilation Heat Loss (Direct Ducted Systems)

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

Ventilation Heat Gain (Direct Ducted Systems)

C	HG^T	Multiplier
1.08	11	11.88

Case 3

Ventilation Heat Loss (Forced Air Systems)

HLbvent		Multiplier
Total Ventilation Load	2854	0.08

Ventilation Heat Gain (Forced Air Systems)

Vent Heat Gain		Multiplier
HGbvent	HG*1.3	0.10
1322	1	

Foundation Conductive Heatloss Level 1

3600 Watts 12283 Btu/h

Foundation Conductive Heatloss Level 2

Watts Btu/h

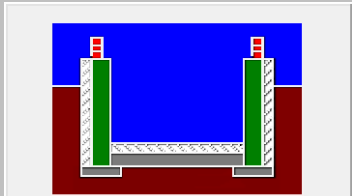
Envelope Air Leakage Calculator

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):	7.32			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Shallow			
House Volume (m ³):	1227.28			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (ACH=3.57)			
Custom BDT Data:	ELA @ 10 Pa. ▼ 322.44 cm ²			
	3.57 ACH @ 50 Pa			
Mechanical Ventilation (L/s):	Total Supply:		Total Exhaust:	
	55.65		55.65	
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Heating Air Leakage Rate (ACH/H):		0.345		
Cooling Air Leakage Rate (ACH/H):		0.100		

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):	25.55	 Insulation Configuration
Floor Width (m):	5.54	
Exposed Perimeter (m):	45.72	
Wall Height (m):	2.74	
Depth Below Grade (m):	1.52	
Window Area (m ²):	4.65	
Door Area (m ²):	0.00	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		3600

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

Package: Package J
Project: Brampton
Model: 87-2-C-WOD Lot 12

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		
x	☒	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 @ 21.2 cfm	42.4 cfm	
Other Bedrooms	5 @ 10.6 cfm	53 cfm	
Bathrooms & Kitchen	7 @ 10.6 cfm	74.2 cfm	
Other rooms	6 @ 10.6 cfm	63.6 cfm	
Total		<u>233.2</u>	

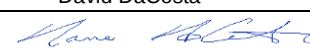
Principal Ventilation Capacity 9.32.3.4(1)			
Master bedroom	1 @ 31.8 cfm	31.8 cfm	
Other bedrooms	5 @ 15.9 cfm	79.5 cfm	
Total		<u>111.3</u>	

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

Heat Recovery Ventilator			
Make	VanEE		
Model	60H		
	107 cfm high		53 cfm low
Sensible efficiency @ -25 deg C			55%
Sensible efficiency @ 0 deg C			65%

Supplemental Ventilation Capacity	
Total ventilation capacity	233.2
Less principal exhaust capacity	111.3
REQUIRED supplemental vent. Capacity	<u>121.9</u> cfm

Supplemental Fans 9.32.3.5.			
Location	cfm	Model	Sones
Ens 1	50	AER50C	0.5
Ens 2	50	AER50C	0.5
Ens 3	50	AER50C	0.5
<i>all fans HVI listed</i>			
	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			
HRAI #	5190	BCIN #	32964
Date	August 17, 2016		



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

Residential Mechanical Ventilation Record (W2)

CSA (F326) Mechanical Ventilation

Project # PJ-00067
Layout # JB-02491

Project Information

Project #: Riverwalk Phase 2 Site/Location: Brampton Notes:
Model/Add.: 87-2-C-WOD Lot 12 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)	Name: David DaCosta	HRAI #: 5190	Designer	
	☐ Downdraft Cook Top	(220 CFM Default)	Address: 2985 Drew Road, Suite 202			
	☐ Other (Exhaust)	(Over 150 CFM)	City: Mississauga	P.C.:		
	Depressurization Test/Calc. Required? ☐ Yes ☒ No		Phone: 905-671-9800	Fax: 647-494-9643		
Exhaust Capacity	Basement & Master Bedroom		2 @ 20 CFM	42 CFM	Installation Checklist	
	Other Bedrooms		5 @ 10 CFM	53 CFM		
	Bathrooms & Kitchen		7 @ 10 CFM	74 CFM		
	Other Hab. Rooms		6 @ 10 CFM	64 CFM		
Total Ventilation Capacity (TVC)		233 CFM		Measured TVC System		
Minimum Continuous Exhaust		I certify this ventilation system design to be in accordance with:				
Kitchen(s) @ 60 CFM = CFM		☒ CSA F326 M-91				
Bathrooms(s) @ 20 CFM = CFM		☐ R-2000				
Total CFM		Signature: <i>David DaCosta</i> Date: January 0, 1900				
TVC System	Location: Base		☐ Control Functioning		Installer	
	Manufacturer/Model: VanEE 60H HVI Listed		☐ Fans Operating and Clean			
	Design Airflow 107 CFM High 53 CFM Low		☐ Filters Clean			
	HRV/ERV 65 % Sensible Efficiency @ 0°C watts		☐ Dampers Accessible			
Additional (Exhaust) Equipment	HRV/ERV 55 % Sensible Efficiency @ -25°C watts		☐ Drain Loop and Connection		Installer	
	Location: Model: CFM: Sones:		☐ Label Supply/Exhaust Hood			
	Ens 1 AER50C 50 2.5		☐ Distribution to all habitable rooms (non-forced air)			
	Ens 2 AER50C 50 2.5		☐ Forced Air System ☐ Contin. Mode ☐ Interlocked			
Ens 3 AER50C 50 2.5		☐ Kitchen Intake Grease Filter		Measured TVC System		
Fan Manufacturer: Broan or Equiv. HVI Listed		☐ Kitchen Exh. 40" to Range				
		☐ Exhaust 4" 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: 87-2-C-WOD Lot 12
Signature: <i>David DaCosta</i>	Date: August 17, 2016	Job #: Riverwalk Phase Official Use:

Project Information

Project #: JB-02491 Site/Location: Brampton Notes:
Model/Add.: 87-2-C-WOD Lot 12 Builder/Client: Highcastle Homes

Floor Area		Total Floor Area: <u>6402</u> ft ²		Line #
(Total Heated Floor Area Including Basement; Count Crawl Space as 1/2 actual Area)				301
Assumed Air Changes Per Hour at 50 Pascal's				
Tight R-2000	0.5 ACH	Typical R-2000	1.0 ACH	Prairies/North (New)
Atlantic (New)	1.5 ACH	Other Provinces (New)	1.4 ACH	Older Homes
or actual test				House ACH50
				<u>1.4</u>
Combustion Appliance Depressurization Limit				
If Spillage Susceptible	-5 Pa.	Flow Factor	0.022	Depressurization Limit @ TVCC
If Non-Spillage Susceptible	-10 Pa.	Flow Factor	0.037	
				Flow Factor <u>0.022</u>
Allowable Net Exhaust				
Floor Area (301)	<u>6402</u> ft ²	x	ACH50 (302)	<u>1.4</u>
		x	Flow Factor (304)	<u>0.022</u>
				= <u>197</u> CFM
				Allowable Net Exhaust @ TVCC
Actual Net Exhaust				
				TVCC Exhaust <u>233</u> CFM
				minus
				TVCC Supply <u>107</u> CFM
				Actual Net Exhaust @ TVCC <u>126</u> CFM
Note: If Supply is greater than Exhaust, use worksheet # W-3B				
Required Make-Up Air Flow				
				Actual Net Exhaust @ TVCC (Line 308)
				minus <u>126</u> CFM
				Allowable Net Exhaust @ TVCC (Line 305)
				<u>197</u> CFM
				Required Make-Up Airflow @ TVCC
				<u>0</u> CFM
				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				
		☐ Required ☒ Not Required		
310				

Prepared By: David DaCosta	HRAI #: 5190	Model/Address: 87-2-C-WOD Lot 12	
Signature: 	Date: August 17, 2016	Job #: JB-02491	Official Use:

—
—

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

Page 7
Project # PJ-00067
Layout # JB-02491

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
87-2-C-WOD Lot 12		
Municipality	Postal code	Reg. Plan number / other description
Brampton		

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 = 593 m ²	☐ ICF Basement ☐ Walkout Basement ☐ Log/Post&Beam
Area of W,S&G = 65 m ²	☐ ICF Above Grade ☐ Slab-on-ground
W,S & G % = 11%	

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]

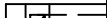
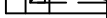
SB-12 Performance:
The annual energy consumption using Subsection 2.1.1. SB-12 Package _____ is _____ GJ (1 GJ = 1000MJ)
The annual energy consumption of this house as designed is _____ GJ
The software used to simulate the annual energy use of the building is: _____
The building is being designed using an air leakage of _____ air changes per hour @50Pa.

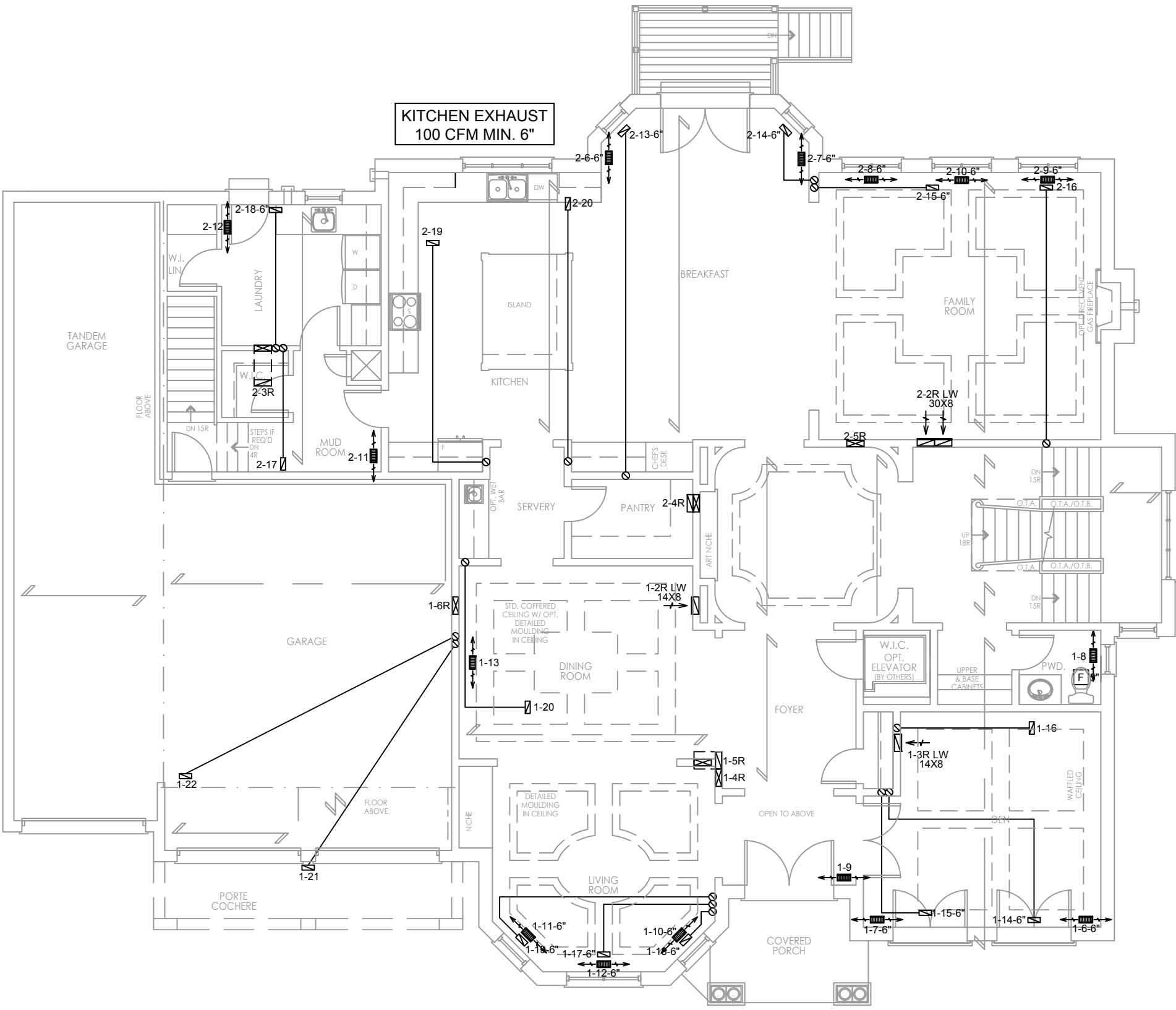
Energy Star: Submit the BOP form with Energy Advisor's certification on completion.

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	BCIN	Signature
David DaCosta	32964	

	FLEX DUCT		LOW/HIGH WALL/KICK SUPPLY DIFFUSER		DUCT CONNECTION TO JOIST LINING		RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)	S.A.	SUPPLY AIR
	RIDIT ROUND DUCT		HRV EXHAUST GRILL		RETURN AIR PIPE RISER		RETURN AIR RISER UP TO FLOOR ABOVE	R.A.	RETURN AIR
	SUPPLY DIFFUSER		SUPPLY AIR PIPE RISER		RETURN ROUND DUCT		RETURN AIR FROM BASEMENT SECOND FLOOR		THERMOSTAT
			VOLUME DAMPER						PRINCIPAL EXHAUST FAN SWITCH
									W/R & PRINCIPAL EXHAUST FAN



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)

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.

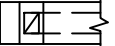
ANY ALTERATIONS TO THIS ORIGINAL PLAN ARE NOT THE RESPONSABILITY OF GTA DESIGNS.

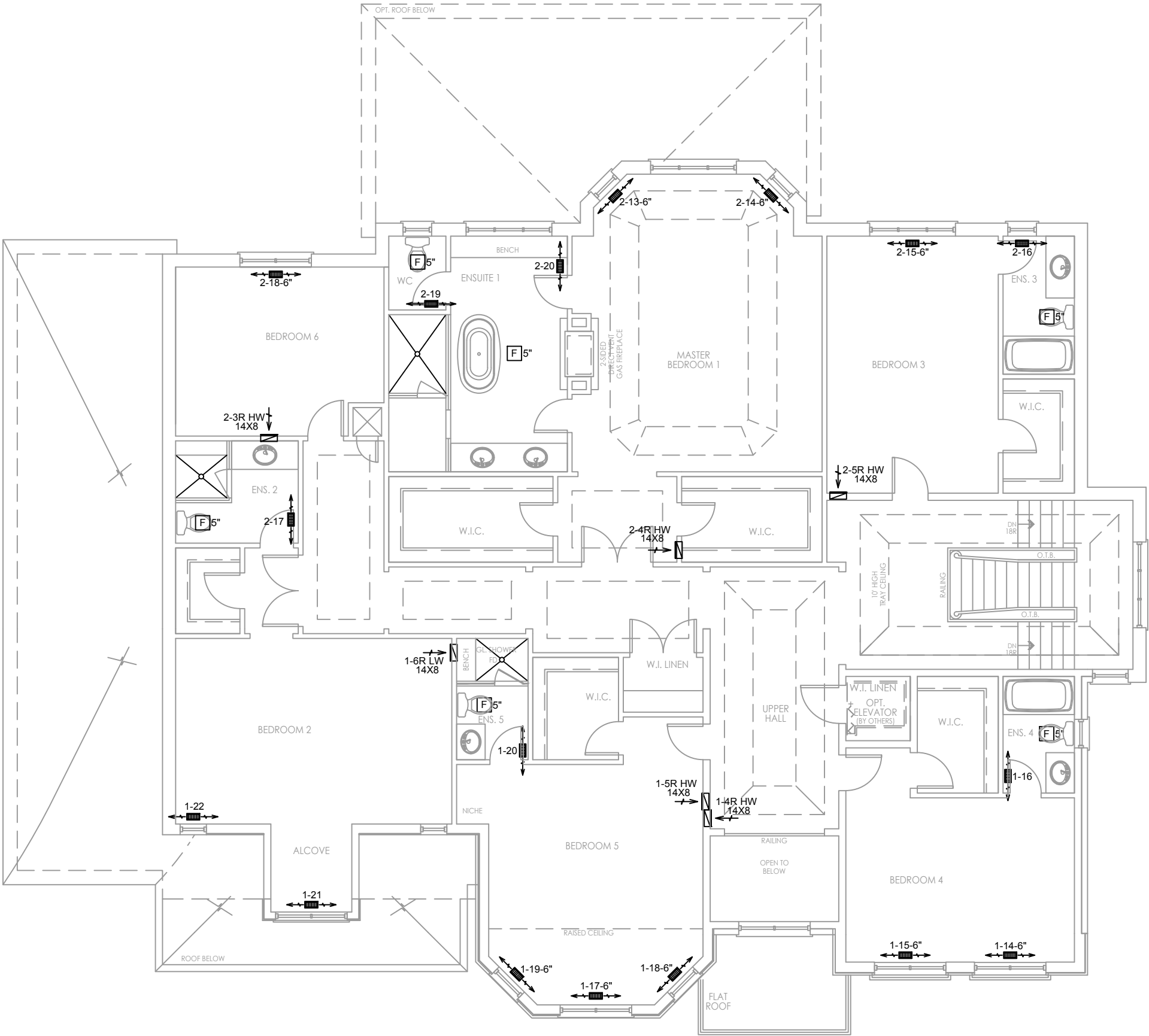
GTA DESIGNS MUST BE CONSULTED IF KITCHEN EXHAUST FAN EXCEEDS 700 CFM DEPRESSURIZATION MAY OCCUR WITH IN THE DWELLING



2985 DREW ROAD
SUITE 202,
MISSISSAUGA, ONT.
L4T 0A4 TEL: 905-671-9800
email: dave@gtadesigns.ca
web: www.gtadesigns.ca

HEAT-LOSS	BTU/HR.	# OF RUNS	S/A	R/A	FANS	DATE:	AUGUST 17, 2016
UNIT MAKE		3RD FLOOR				CLIENT:	HIGHCASTLE HOMES
UNIT MODEL		2ND FLOOR	17	6	6	MODEL:	87-2-C-WOD LOT 12
UNIT HEATING INPUT	BTU/HR.	1ST FLOOR	15	3	2	PROJECT:	RIVERWALK PHASE 2 BRAMPTON, ONT
UNIT HEATING OUTPUT	BTU/HR.	BASEMENT	11	2		SCALE:	1/8" = 1"-0"
A/C COOLING CAPACITY	TONS.	FLOOR PLAN:					
FAN SPEED	CFM	GROUND FLOOR					
		DRAWN BY:	JL	CHECKED:	DD	SQFT	6402
		LAYOUT NO.	JB-02491	DRAWING NO.	M2		

 FLEX DUCT	 RIDIT ROUND DUCT	 SUPPLY DIFFUSER	 LOW/HIGH WALL/KICK SUPPLY DIFFUSER	 HRV EXHAUST GRILL	 SUPPLY AIR PIPE RISER	 VOLUME DAMPER	 DUCT CONNECTION TO JOIST LINING	 RETURN AIR PIPE RISER	 RETURN ROUND DUCT	 RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)	 RETURN AIR RISER UP TO FLOOR ABOVE	 RETURN AIR FROM BASEMENT SECOND FLOOR	S.A. R.A.   F PE	SUPPLY AIR RETURN AIR THERMOSTAT PRINCIPAL EXHAUST FAN SWITCH W/R & PRINCIPAL EXHAUST FAN
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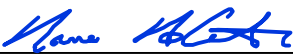
INSULATE ALL DUCTS IN UNCONDITIONED SPACES MIN. R12

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

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

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 FAN EXCEEDS 700 CFM DEPRESSURIZATION MAY OCCUR WITH IN THE DWELLING



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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	17	6	6
1ST FLOOR	15	3	2
BASEMENT	11	2	

FLOOR PLAN: SECOND FLOOR		
DRAWN BY: JL	CHECKED: DD	SQFT 6402
LAYOUT NO. JB-02491	DRAWING NO. M3	

DATE:	AUGUST 17, 2016
CLIENT:	HIGHCASTLE HOMES
MODEL:	87-2-C-WOD LOT 12
PROJECT:	RIVERWALK PHASE 2 BRAMPTON, ONT
SCALE:	1/8" = 1'-0"