gtaDesigns

Schedule 1: Designer Information

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: **40-1 Bungalow Northglen**		Lot:	0
		Lot/con.	
Municipality: **Clarington, ON**	Postal code:	Plan number/ other description:	

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	Project #:	15-34
Heating and Cooling Load Calculations	Builder	**Highcastle Homes**	
Air System Design	Project	**Northglen**	
Residential mechanical ventilation Design Summary	Model	**40-1 Bungalow Northglen**	
Residential System Design per CAN/CSA-F280-12			
Residential New Construction - Forced Air	SB-12	**Package D**	

D. Declaration of Designer

I David DaCosta 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 **32964**

Basis for exemption from registration: **Division C 3.2.4.1. (4)**

❑ 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.

April 15, 2015

Date

Signature of Designer

NOTE:

1. 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.
2. Schedule 1 does not require to be completed a holder of a license, temporay license, or a certificate of authorization, issed by the Ontario Associstion 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.

gtaDesigns

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

Heat loss and gain calculation summary sheet

CSA-F280-M12 Standard Form No. 1

These documents issued for the use of **Highcastle Homes** and may not be used by any other persons without authorization. Documents for permit and/or construction are signed in red.

Project No. **15-34**

Building Location

Address (Model):	**40-1 Bungalow Northglen**	Site:	**Northglen**
Model:		Lot:	
City and Province:	**Clarington, ON**	Postal code:	

Calculations based on

Dimensional information based on:			**N/A**		
Attachment:	**Detached**		Front facing:	**East/West**	Assumed? **Yes**
No. of Levels:	**2**	Ventilated? **Included**	Air tightness:	**1961- Present (ACH=3.57)**	Assumed? **Yes**
Weather location:	**Toronto (city hall)**		Wind exposure:	**Shelterd**	
HRV?	**Broan**	**684N**	Internal shading:	**Light-translucent**	Occupants: **3**
Recovery % at -25C	**0**	Recovery % at -0C **0**	Units:	**Imperial**	

Heating design conditions				Cooling design conditions			
Outdoor temp	**-0.4**	Indoor temp: **72**	Mean soil temp **50**	Outdoor temp	**88**	Indoor temp: **75**	Latitude: **44**

Above grade walls				Below grade walls			
Style A:	**As per Selected OBC SB12**	**Package D**	**R 24**	Style A:	**As per Selected OBC SB12**	**Package D**	**R 20**
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 D**	Style A:	**As per Selected OBC SB12**	**Package D**	**R 50**
Style B:			Style B:	**As per Selected OBC SB12**	**Package D**	**R 31**
Exposed floors			Style C:			
Style A:	**As per Selected OBC SB12**	**Package D R 31**	**Doors**			
Style B:			Style A:	**As per Selected OBC SB12**	**Package D**	**R 3.01**
Windows			Style B:			
Style A:	**As per Selected OBC SB12**	**Package D 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 D**	**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**

gtaDesigns

Air System Design

Package D

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

Builder: Highcastle Homes | Date: April 15, 2015 | **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.

Project #: 15-34

Project: Northglen | Model: 40-1 Bungalow Northglen

Individual BCIN: 32964 | David DaCosta | Page 3

DESIGN LOAD SPECIFICATIONS

Level 1 Net Load	12,103	btu/h
Level 2 Net Load	15,149	btu/h
Level 3 Net Load	0	btu/h
Level 4 Net Load	0	btu/h
Total Heat Loss	27,252	btu/h
Total Heat Gain	14,794	btu/h
Total Heat Loss + 10%	29,977	Btuh.
Building Volume Vb	23580	ft³
Ventilation Load	4,141	Btuh.
Ventilation PVC	45	cfm
Supply Branch and Grill Sizing		

AIR DISTRIBUTION & PRESSURE

Equipment External Static Pressure	0.5	"w.c.
Additional Equipment Pressure Drop	0.225	"w.c.
Available Design Pressure	0.275	"w.c.
Return Branch Longest Effective Length	300	ft
R/A Plenum Pressure	0.138	"w.c.
S/A Plenum Pressure	0.14	"w.c.
Heating Air Flow Proportioning Factor	0.0284	cfm/btuh
Cooling Air Flow Proportioning Facter	0.0481	cfm/btuh
R/A Temp	70	deg. F.
S/A Temp	116	deg. F.
Diffuser loss	0.01	"w.c.

FURNACE/AIR HANDLER DATA:

Make	Amana	
Model	GMEC960402BNA	
Input Btu/h	40000	
Output Btu/h	38400	
E.s.p.	0.50	" W.C.
Water Temp		deg. F.
AFUE	96%	
Aux. Heat		
SB-12 Package	Package D	
Temp. Rise>>>	46	deg. F.

BOILER/WATER HEATER DATA:

Make	Type	
Model		
Input Btu/h		
Output Btu/h		
Min.Output Btu/h	AWH	

A/C UNIT DATA:

Amana	1.5	Ton
Cond.----------	1.5	
Coil ----------	1.5	

Blower DATA:

Blower Speed Selected:	W2	Blower Type	ECM
		(Brushless DC OBC 12.3.1.5.(2))	
Heating Check	773 cfm	Cooling Check	711 cfm
Selected cfm>	773 cfm	Cooling Air Flow Rate	711 cfm

Level 1 Outlets

S/A Outlet No.	12	13	14	15	16									
Room Use	BASE	BASE	BASE	BASE	BASE									
Btu/Outlet	2421	2421	2421	2421	2421									
Heating Airflow Rate CFM	69	69	69	69	69									
Cooling Airflow Rate CFM	10	10	10	10	10									
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
Actual Duct Length	33	22	27	23	38									
Equivalent Length	120	130	100	145	135	90	90	90	90	90	90	90	90	90
Total Effective Length	153	152	127	168	173	90	90	90	90	90	90	90	90	90
Adjusted Pressure	0.08	0.09	0.10	0.08	0.08	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Duct Size Round	5	5	5	6	6									
Outlet Size	3x10	3x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10
Trunk	C	A	A	B	B									

Level 2 Outlets

S/A Outlet No.	1	2	3	4	5	6	7	8	9	10	11			
Room Use	MAST	ENS	WIC	BED 2	LAUND	FOY	KIT	DIN	GREAT	GREAT	BATH			
Btu/Outlet	1659	1410	431	1879	577	2186	2086	1624	1582	1582	132			
Heating Airflow Rate CFM	47	40	12	53	16	62	59	46	45	45	4			
Cooling Airflow Rate CFM	95	39	6	47	8	49	158	83	86	86	4			
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
Actual Duct Length	40	29	21	12	15	37	44	22	42	41	10			
Equivalent Length	125	165	100	130	140	120	110	150	155	135	120	90	90	90
Total Effective Length	165	194	121	142	155	157	154	172	197	176	130	90	90	90
Adjusted Pressure	0.08	0.07	0.11	0.09	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.10	0.14	0.14
Duct Size Round	6	5	3	5	3	5	6	6	6	6	2			
Outlet Size	4x10	3x10	3x10	3x10	3x10	3x10	4x10	4x10	4x10	4x10	3x10	4x10	4x10	4x10
Trunk	B	B	A	A	C	C	C	A	B	B	A			

Level 3 Outlets

S/A Outlet No.														
Room Use														
Btu/Outlet														
Heating Airflow Rate CFM														
Cooling Airflow Rate CFM														
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
Actual Duct Length														
Equivalent Length	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Total Effective Length	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Adjusted Pressure	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														
Outlet Size	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10
Trunk														

Level 4 Outlets

S/A Outlet No.														
Room Use														
Btu/Outlet														
Heating Airflow Rate CFM														
Cooling Airflow Rate CFM														
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
Actual Duct Length														
Equivalent Length	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Total Effective Length	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Adjusted Pressure	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														
Outlet Size	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10
Trunk														

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	156	156	305	156							
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	28	14	9	11							
Equivalent Length	175	185	110	145	70	70	70	70	70	70	70
Total Effective Length	203	199	119	156	70	70	70	70	70	70	70
Adjusted Pressure	0.06	0.06	0.10	0.08	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Duct Size Round	8	8	9	8							
Inlet Size	8	8	8	FLC							
" "	x	x	x	x	x	x	x	x	x	x	x
Inlet Size	14	14	30								

Return Trunk Duct Sizing

Trunk	CFM	Press.	Round	Rect. Size	
Drop	773	0.05	14.5	24x10	
X	773	0.05	14.5	24x8	18x10
Y	312	0.05	10.5	12x8	10x10
Z					
W					
V					
U					
T					
S					
R					
Q					

Supply Trunk Duct Sizing

Trunk	CFM	Press.	Round	Rect. Size	
A	567	0.06	12.5	18x8	14x10
B	314	0.06	10.0	12x8	10x10
C	206	0.06	8.5	8x8	107
D					
E					
F					
G					
H					
I					
J					
K					

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Heatloss/Gain Calculations CSA-F280-12

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e-mail dave@gtadesigns.ca

Builder: Highcastle Homes | Date: April 15, 2015 | Weather Data: Toronto (city hall) 44 -0.4 88 45 50 | Project # 15-34

2012 OBC | Project: Northglen | Model: 40-1 Bungalow Northglen | **System 1** | Heat Loss ^T 72.4 deg. F | Ht gain ^T 12.8 deg. F | GTA: 1474 | Page 4

Level 1

	BASE																													
Run ft. exposed wall A	187	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	
Ceiling height	2	AG		2	AG		2	AG		2	AG		2	AG		2	AG		2	AG		2	AG		2	AG		2	AG	
Floor area	1350	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	374																													
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	22.98	11.88	3	69	36																											
East/West	3.15	22.98	28.32	3	69	85																											
South	3.15	22.98	21.85	9	207	197																											
Existing Windows	1.99	36.38	23.05																														
Skylight	2.03	35.67	89.12																														
Doors	3.01	24.05	4.25	21	505	89																											
Net exposed walls A	13.79	5.25	0.93	338		314																											
Net exposed walls B	8.50	8.52	1.51																														
Exposed Ceilings A	50.00	1.45	0.80																														
Exposed Ceilings B	22.86	3.17	1.74																														
Exposed Floors	22.05	3.28	0.31																														
Foundation Conductive Heatloss	Slab On Grade (x)				7257																												
Total Conductive – Heat Loss					8107																												
Total Conductive – Heat Gain						720																											
Air Leakage – Heat Loss/Gain		0.2326	0.0062		1885	4																											
Ventilation – Case 1	X	0.26	0.09		2111	67																											
Ventilation – Case 2		78.19	13.82																														
Ventilation – Case 3		0.17	0.09																														
Heat Gain People			239																														
Appliances Loads	1 =.25 percent		3327																														
Duct and Pipe loss			10%																														
Level 1 HL Total	12,103	Total HL for per room			12103																												
Level 1 HG Total	1,029	Total HG per room	x 1.3			1029																											

Level 2

	MAST			ENS			WIC			BED 2			LAUND			FOY			KIT			DIN			GREAT			BATH				
Run ft. exposed wall A	15	A		19	A		7	A		25	A		9	A		28	A		33	A		13	A		31	A			A			A
Run ft. exposed wall B		B			B			B			B			B			B			B			B			B			B			B
Ceiling height	9			9			9			9			9			9			9			9			9			9			9	
Floor area	184	Area		74	Area		37	Area		125	Area		61	Area		97	Area		206	Area		186	Area		225	Area		75	Area			Area
Exposed Ceilings A	184	A		74	A		37	A		125	A		61	A		97	A		206	A		186	A		225	A		75	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	135			171			63			225			81			252			297			117			279							
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	22.98	11.88										16	368	190				16	368	190														
East/West	3.15	22.98	28.32	25	575	708	13	299	368										9	207	255							38	873	1076					
South	3.15	22.98	21.85																						28	644	612	14	322	306					
Existing Windows	1.99	36.38	23.05																																
Skylight	2.03	35.67	89.12																																
Doors	3.01	24.05	4.25																																
Net exposed walls A	15.13	4.79	0.85	110	526	93	158	756	134	63	301	53	209	1000	177	81	388	69	227	1086	192	297	1421	251	89	426	75	227	1086	192					
Net exposed walls B	8.50	8.52	1.51																																
Exposed Ceilings A	50.00	1.45	0.80	184	266	146	74	107	59	37	54	29	125	181	100	61	88	49	97	140	77	206	298	164	186	269	148	225	326	179	75	109	60		
Exposed Ceilings B	22.86	3.17	1.74																																
Exposed Floors	22.05	3.28	0.31																																
Foundation Conductive Heatloss	Slab On Grade (x)		x																																
Total Conductive – Heat Loss					1367			1162			355			1549			476			1801			1719			1339			2607			109			
Total Conductive – Heat Gain						947			561			83			466			117			714			415			835			1753			60		
Air Leakage – Heat Loss/Gain		0.1007	0.0062		138	6		117	3		36	1		156	3		48	1		181	4		173	3		135	5		262	11		11	0		
Ventilation – Case 1	X	0.11	0.09		154	88		131	52		40	8		175	43		54	11		203	67		194	39		151	78		294	163		12	6		
Ventilation – Case 2		78.19	13.82																																
Ventilation – Case 3		0.17	0.09																																
Heat Gain People			239	2		478							1		239																				
Appliances Loads	1 =.25 percent		3327																			3		2080	1		416	1		832					
Duct and Pipe loss			10%																																
Level 2 HL Total	15,149	Total HL for per room			1659			1410			431			1879			577			2186			2086			1624			3164			132			
Level 2 HG Total	13,764	Total HG per room	x 1.3			1976			801			118			977			167			1021			3297			1734			3587			85		

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

Total Heat Loss	27,252	btu/h
Total Heat Gain	14,794	btu/h

Package D

gtaDesigns

Heatloss/Gain Calculations CSA-F280-12

2985 Drew Road, Suite 202, Mississauga, Ontario L4T 0A4 Tel: 905-671-9800 Fax: 647-494-9643

e-mail dave@gtadesigns.ca

Builder: Highcastle Homes | Date: April 15, 2015 | Weather Data: Toronto (city hall) 44 -0.4 88 45 50 | Project # 15-34

2012 OBC | Project: Northglen | Model: 40-1 Bungalow Northglen | System 1 | Heat Loss ^T 72.4 deg. F | Ht gain ^T 12.8 deg. F | GTA: 1474 | Page 5

Level 3

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	22.98	11.88																						
East/West	3.15	22.98	28.32																						
South	3.15	22.98	21.85																						
Existing Windows	1.99	36.38	23.05																						
Skylight	2.03	35.67	89.12																						
Doors	3.01	24.05	4.25																						
Net exposed walls A	15.13	4.79	0.85																						
Net exposed walls B	8.50	8.52	1.51																						
Exposed Ceilings A	50.00	1.45	0.80																						
Exposed Ceilings B	22.86	3.17	1.74																						
Exposed Floors	22.05	3.28	0.31																						
Foundation Conductive Heatloss																									
Total Conductive: Heat Loss																									
Total Conductive: Heat Gain																									
Air Leakage: Heat Loss/Gain		0.0000	0.0062																						
Ventilation: Case 1	X	0.0000	0.0932																						
Ventilation: Case 2		78.19	13.82																						
Ventilation: Case 3		0.17	0.09																						
Heat Gain People			239																						
Appliances Loads	1 =.25 percent		3327																						
Duct and Pipe loss			10%																						
Level 3 HL Total	0	Total HL for per room																							
Level 3 HG Total	0	Total HG per room x 1.3																							

Level 4

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	22.98	11.88																						
East/West	3.15	22.98	28.32																						
South	3.15	22.98	21.85																						
Existing Windows	1.99	36.38	23.05																						
Skylight	2.03	35.67	89.12																						
Doors	3.01	24.05	4.25																						
Net exposed walls A	15.13	4.79	0.85																						
Net exposed walls B	8.50	8.52	1.51																						
Exposed Ceilings A	50.00	1.45	0.80																						
Exposed Ceilings B	22.86	3.17	1.74																						
Exposed Floors	22.05	3.28	0.31																						
Foundation Conductive Heatloss																									
Total Conductive: Heat Loss																									
Total Conductive: Heat Gain																									
Air Leakage: Heat Loss/Gain		0.0000	0.0062																						
Ventilation: Case 1	X	0.00	0.09																						
Ventilation: Case 2		78.19	13.82																						
Ventilation: Case 3		0.17	0.09																						
Heat Gain People			239																						
Appliances Loads	1 =.25 percent		3327																						
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	27,252	btu/h
Total Heat Gain	14,794	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

Package D

gtaDesigns
2985 Drew Road, Suite 202, Mississauga, Ontario L4T 0A4 Tel: 905-671-9800 Fax: 647-494-9643
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. Individual BCIN: 32964 David DaCosta

Project: **Clarington, ON** **Model:** **40-1 Bungalow Northglen**

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	Clarington, ON
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)	x	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	x	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	X	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	1	@	10	cfm	10	cfm
Bathrooms & Kitchen	3	@	10	cfm	30	cfm
Other rooms	3	@	10	cfm	30	cfm
			Total		110	

Principal Ventilation Capacity 9.32.3.4(1)

Master bedroom	1	@	30	cfm	30	cfm
Other bedrooms	1	@	15	cfm	15	cfm
			Total		45	

Principal Exhaust Fan Capacity

Make	Model	Location
Broan	684N	Ensuite
90 cfm		Sones

Heat Recovery Ventilator

Make	Broan		
Model	684N		
	90 cfm high		cfm low
HRV is HVI listed	Sensible efficiency @ -25 deg C	0	
	Sensible Apparent efficiency @ -25 (	0	

Supplemental Ventilation Capacity

Total ventilation capacity	110.0	
Less principal exhaust capacity	45.0	
REQUIRED supplemental vent. Capacity	65.0	cfm

Supplemental Fans 9.32.3.5.

Location	cfm	Model	Sones
Ens	50	770	2.5
Bath	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			
HRAI #	5190	BCIN #	32964
Date	April 15, 2015		

Energy Efficiency Design Summary
(Part 9 Residential)

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

Project # **15-34**

This form is used to summarize the energy efficiency design of the project. Information on completing this form is on the reverse

For use by Principal Authority	
Application No:	Model/Certification Number

A. Project Information

Building number, street name		Unit number	Lot/Con
40-1 Bungalow Northglen			
Municipality **Clarington, ON**	Postal code	Reg. Plan number / other description	

B. Compliance Option

☑ *SB-12 Prescriptive* [SB-12 - 2.1.1.]	Table: Package: A B C D E F G H I J K L M	**Package D**
☐ *SB-12 Performance** [SB-12 - 2.1.2.]	* Attach energy performance calculations using an approved software	
☐ *Energy Star®** [SB-12 - 2.1.3.]	* Attach 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		
Gross Wall Area =	185 m²	% Windows+ 9%	☐ ICF Basement	☐ Walkout Basement	☐ Log/Post&Beam
Gross Window+ Area =	16 m²		☐ 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
Thermal Insulation		**Windows & Doors**[1]	
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	24	Space Heating Equip.[2]	94%
Basement Walls	20	HRV Efficiency (%)	0%
Slab (all >600mm below grade)	x	DHW Heater (EF)	0.67
Slab (edge only ≤600mm below grade)	10	NOTES 1. Provide U-Value in W/m2.K, or ER rating	
Slab (all ≤600mm below grade, or heated)	10	2. Provide AFUE or indicate if condensing type combined system used	

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: BOP form attached. The house will be labeled on completion by:

Energy Star and *EnerGuide80*:

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

F. Designers [names of designers who are responsible for the building code design and whose plans accompany the permit application]

Architectural	Mechanical
	David DaCosta

gtaDesigns

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

Project: Clarington, ON **Model:** 40-1 Bungalow Northglen

Air Leakage Calculations

Air Leakage Calculations

Building Air Leakage Heat Loss				
B	LRairh	Vb	HL^T	HLleak
0.018	0.102	23580	72.4	3142

Building Air Leakage Heat Gain				
B	LRairh	Vb	HG^T	HG Leak
0.018	0.008	23580	12.8	41

Air Leakage Heat Loss/Gain Multiplier Table (Section 11)				
Level	Level Factor (LF)	Building Air	Level Conductive Heat Loss	Air Leakage Heat Loss Multiplier
1	0.6	3142	8107	0.2326
2	0.4		12485	0.1007
3	0		0	0.0000
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

		Air Leakage Heat Gain
HG LEAK	41	0.0062
BUILDING CONDUCTIVE HEAT GAIN	6672	

Levels this Dwelling
2

Air Leakage Calculations

Ventilation Calculations

Vent

Ventilation Heat Loss

Ventilation Heat Loss				
C	PVC	HL^T	(1-E) HRV	HLbvent
1.08	45	72.4	1.00	3519

Ventilation Heat Gain

Ventilation Heat Gain			
C	PVC	HG^T	HGbvent
1.1	45	12.8	622

Vent

Case 1

Case 1

Ventilation Heat Loss (Exhaust only Systems)

Case 1 - Exhaust Only				
Level	LF	HLbvent	LVL Cond. HL	Multiplier
1	0.6	3519	8107	0.26
2	0.4		12485	0.11
3	0		0	0.00
4	0		0	0.00

Ventilation Heat Gain (Exhaust Only Systems)

Case 1 - Exhaust Only		Multiplier
HGbvent	622	0.09
Building	6672	

Case 1

Case 2

Case 2

Ventilation Heat Loss (Direct Ducted Systems)

			Multiplier
C	HL^T	(1-E) HRV	78.19
1.08	72.4	1.00	

Ventilation Heat Gain (Direct Ducted Systems)

		Multiplier
C	HG^T	13.82
1.08	12.8	

Case 2

Case 3

Case 3

Ventilation Heat Loss (Forced Air Systems)

	HLbvent	Multiplier
Total Ventilation Load	3519	0.17

Ventilation Heat Gain (Forced Air Systems)

		Vent Heat Gain	Multiplier
HGbvent	HG*1.3	622	0.09
622	1		

Case 3

Envelope Air Leakage Calculator

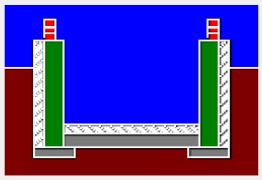
Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Newcastle (Bowmanville)
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):	3.35
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	667.79
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: 0 / Total Exhaust: 22.5
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Envelope Air Leakage Rate	
Heating Air Leakage Rate (ACH/H):	**0.102**
Cooling Air Leakage Rate (ACH/H):	**0.008**

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Newcastle (Bowmanville)
Site Description	
Soil Conductivity:	High conductivity: moist soil
Water Table:	Normal (7-10 m, 23-33 Ft)

Foundation Dimensions		
Floor Length (m):	23.06	 Insulation Configuration
Floor Width (m):	5.44	
Exposed Perimeter (m):	57.00	
Wall Height (m):	2.74	
Depth Below Grade (m):	2.13	
Window Area (m^2):	1.39	
Door Area (m^2):	1.95	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	23	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	**2127**	

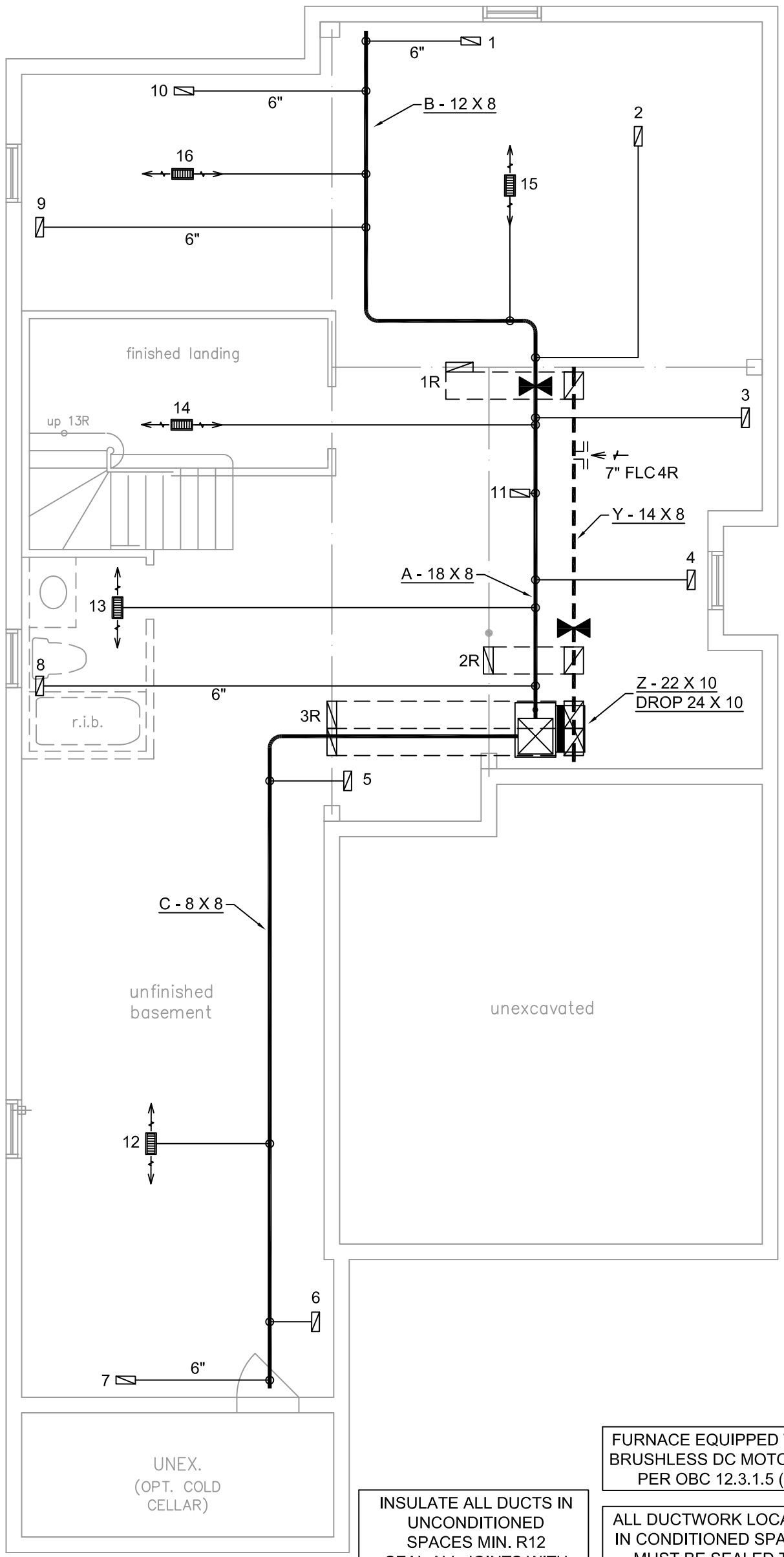
H.V.A.C. SYMBOLS

	FLEX DUCT
	RIDIT ROUND DUCT
	SUPPLY MAIN DUCT
	SUPPLY DIFFUSER
	LOW/HIGH WALL SUPPLY DIFFUSER
	HRV EXHAUST GRILL
	SUPPLY AIR PIPE RISER
	VOLUME DAMPER

ABBREVIATIONS

S.A.	SUPPLY AIR
R.A.	RETURN AIR
T	THERMOSTAT
$	PRINCIPAL EXHAUST FAN SWITCH
	RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)
	RETURN AIR PIPE RISER
	DUCT CONNECTION TO JOIST LINING
	RETURN MAIN DUCT
	RETURN ROUND DUCT
	RETURN AIR RISER UP TO FLOOR ABOVE
	RETURN AIR FROM BASEMENT SECOND FLOOR
F	W/R EXHAUST FAN
PE	W/R PRINCIPAL EXHAUST FAN

ZONE 1 COMPLIANCE PACKAGE "D" REF. TABLE 2.1.1.2.A	
SPACE HEATING EFFICEINCY(%)	94%
HRV EFFICEINCY(%)	N/A
DHW EFFICIENCY(EF)	.67
CEILING WITH ATTIC SPACE	R-50
WALLS ABOVE GRADE	R-24
EXPOSED FLOORS	R-31
BASEMENT WALLS	R-20
WINDOWS AND SLIDING GLASS DOORS U-VALUE	1.8



OBC 2006

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 ot Designer

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

INSULATE ALL DUCTS IN UNCONDITIONED SPACES MIN. R12 SEAL ALL JOINTS WITH APPROVED SEALANT OR FOIL TAPE

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

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

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 EXHUAST FAN EXCEEDS 700 CFM DEPRESSURIZATION MAY OCCUR WITH IN THE DWELLING

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

HEAT-LOSS	32,705 BTU/HR.
UNIT MAKE	AMANA
UNIT MODEL	GMEC960402BNA
UNIT HEATING INPUT	40,000 BTU/HR.
UNIT HEATING OUTPUT	38,400 BTU/HR.
A/C COOLING CAPACITY	1.5 TONS.
FAN SPEED	773 CFM

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

FLOOR PLAN:	BASEMENT
DRAWN BY	D. DACOSTA
SQFT	1474
LAYOUT NO.	15-34
DRAWING NO.	1/2

DATE:	MARCH 5, 2015
CLIENT:	HIGHCASTLE HOMES
PROJECT:	40-I BUNGALOW NORTHGLEN CLARINGTON, ON.
SCALE:	3/16" = 1"-0"

H.V.A.C. SYMBOLS

	FLEX DUCT
	RIDIT ROUND DUCT
	SUPPLY MAIN DUCT
	SUPPLY DIFFUSER
	LOW/HIGH WALL SUPPLY DIFFUSER
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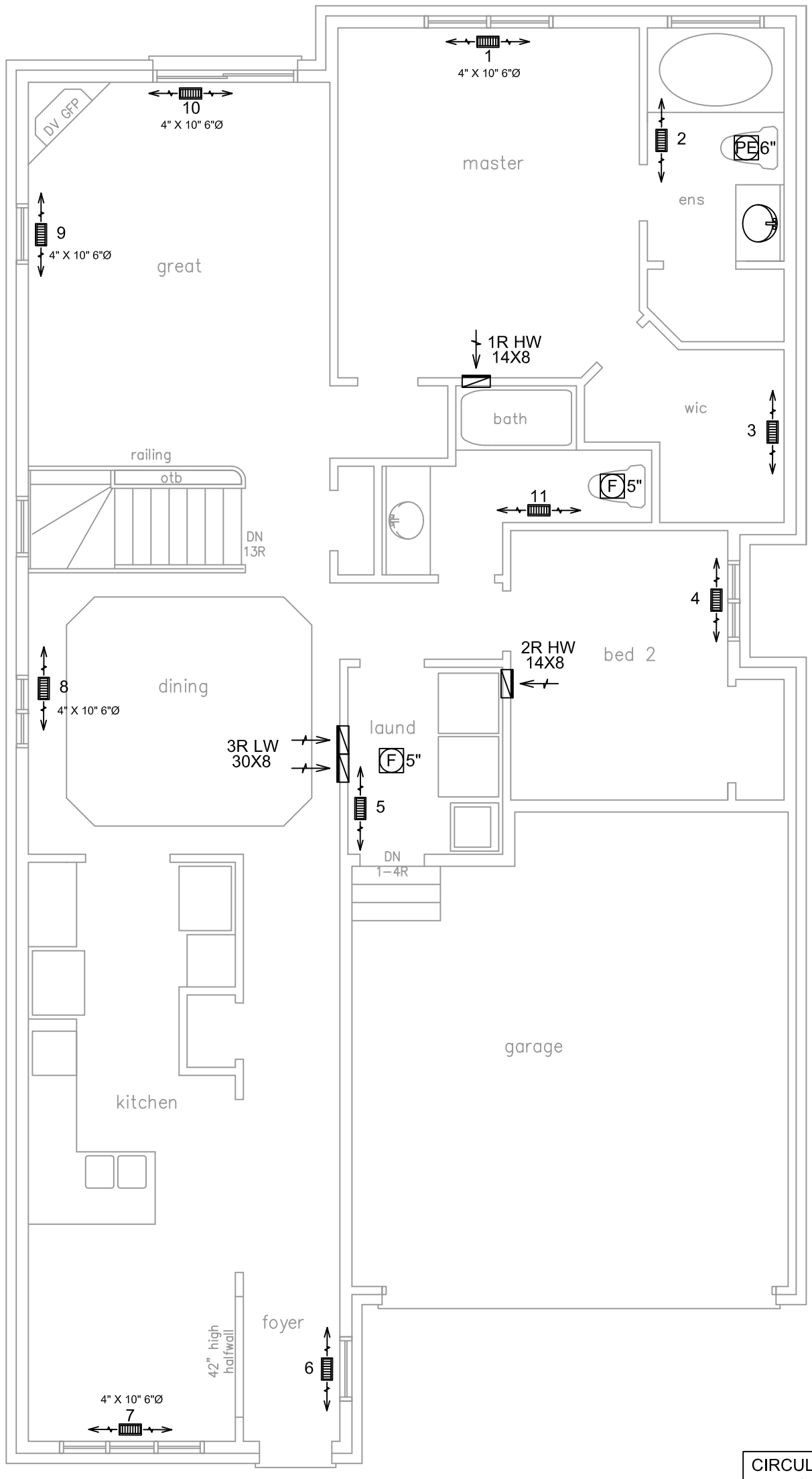
	RETURN ROUND DUCT
	RETURN AIR RISER UP TO FLOOR ABOVE
	RETURN AIR FROM BASEMENT SECOND FLOOR
F	W/R EXHAUST FAN
PE	W/R PRINCIPAL EXHAUST FAN

INSULATED ALL DUCTS IN UNCONDITIONED SPACES MIN. R12 SEAL ALL JOINTS WITH APPROVED SEALANT OR FOIL TAPE

CIRCULATION FAN SWITCH TO BE CENTRALLY LOCATED



CIRCULATION FAN SWITCH TO BE CENTRALLY LOCATED

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

INSULATE ALL DUCTS IN UNCONDITIONED SPACES MIN. R12 SEAL ALL JOINTS WITH APPROVED SEALANT OR FOIL TAPE

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

OBC 2006

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 ot Designer

ZONE 1 COMPLIANCE PACKAGE "D" 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.
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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			
1ST FLOOR			
BASEMENT			

FLOOR PLAN: GROUND FLOOR
DRAWN BY: D. DACOSTA
SQFT: 1474
LAYOUT NO.: 15-34
DRAWING NO.: 2/2

DATE: MARCH 5, 2015
CLIENT: HIGHCASTLE HOMES
PROJECT: 40-1 BUNGALOW NORTHGLEN CLARINGTON, ON.
SCALE: 3/16" = 1"-0"