


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

A. Project Information					
Building number, street name				Lot:	
Model 2700 WOB				Lot/con.	
Municipality		Postal code	Plan number/ other description		
Richmond Hill					
B. Individual who reviews and takes responsibility for design activities					
Name		Firm			
David DaCosta		gtaDesigns Inc.			
Street address				Unit no.	Lot/con.
2985 Drew Road, Suite 202					
Municipality		Postal code	Province	E-mail	
Mississauga		L4T 0A4	Ontario	hvac@gta designs.ca	
Telephone number		Fax number		Cell number	
(905) 671-9800					
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 of Division C]					
<input type="checkbox"/> House <input checked="" type="checkbox"/> HVAC – House <input type="checkbox"/> Building Structural <input type="checkbox"/> Small Buildings <input type="checkbox"/> Building Services <input type="checkbox"/> Plumbing – House <input type="checkbox"/> Large Buildings <input type="checkbox"/> Detection, Lighting and Power <input type="checkbox"/> Plumbing – All Buildings <input type="checkbox"/> Complex Buildings <input type="checkbox"/> Fire Protection <input type="checkbox"/> On-site Sewage Systems					
Description of designer's work				Model Certification	
				Project #:	PJ-00267
				Layout #:	JB-09156
Heating and Cooling Load Calculations		Main	X	Builder	EM Air Systems
Air System Design		Alternate		Project	King East Developments
Residential mechanical ventilation Design Summary		O.D. GFA	2700	Model	Model 2700 WOB
Residential System Design per CAN/CSA-F280-12				SB-12	Energy Star
Residential New Construction - Forced Air					
D. Declaration of Designer					
<p>I, <u>David DaCosta</u> declare that (choose one as appropriate):</p> <p style="text-align: center;">(print name)</p> <p><input type="checkbox"/> 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.</p> <p style="text-align: right;">Individual BCIN: _____</p> <p style="text-align: right;">Firm BCIN: _____</p> <p><input checked="" type="checkbox"/> 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.</p> <p style="text-align: right;">Individual BCIN: <u>32964</u></p> <p style="text-align: right;">Basis for exemption from registration: <u>Division C 3.2.4.1. (4)</u></p> <p><input type="checkbox"/> The design work is exempt from the registration and qualification requirements of the Building Code.</p> <p style="text-align: right;">Basis for exemption from registration and qualification: _____</p>					
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>September 21, 2023</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 EM Air Systems				Layout No.	
and may not be used by any other persons without authorization. Documents for permit and/or construction are signed in red.				JB-09156	
Building Location					
Address (Model): Model 2700 WOB			Site: King East Developments		
Model:			Lot:		
City and Province: Richmond Hill			Postal code:		
Calculations based on					
Dimensional information based on:			Architectural Design Inc.Feb/2023		
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: Richmond Hill			Wind exposure: Sheltered		
HRV? VanEE V150E75NS			Internal shading: Light-translucent		Occupants: 5
Sensible Eff. at -25C 60%		Apparent Effect. at -0C 80%		Units: Imperial	Area Sq ft: 2700
Sensible Eff. at -0C 75%					
Heating design conditions			Cooling design conditions		
Outdoor temp -5.8 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 OBC SB12 Energy Star R 22 + 5ci			Style A: As per OBC SB12 Energy Star R 20ci		
Style B:			Style B:		
Style C:			Style C:		
Style D:			Style D:		
Floors on soil			Ceilings		
Style A: As per Selected OBC SB12 Energy Star			Style A: As per Selected OBC SB12 Energy Star R 60		
Style B:			Style B: As per Selected OBC SB12 Energy Star R 31		
Exposed floors			Style C:		
Style A: As per Selected OBC SB12 Energy Star R 31			Doors		
Style B:			Style A: As per Selected OBC SB12 Energy Star R 4.00		
Windows			Style B:		
Style A: As per Selected OBC SB12 Energy Star R 4.00			Style C:		
Style B:			Skylights		
Style C:			Style A: As per Selected OBC SB12 Energy Star R 2.03		
Style D:			Style B:		
Attached documents: As per Shedule 1		Heat Loss/Gain Caculations based on CSA-F280-12 Effective R-Values			
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:		
City: Mississauga			E-mail hvac@gtadesigns.ca		

Builder: **EM Air Systems**

Date: **September 21, 2023**

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.

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Project: **King East Developments**

Model: **Model 2700 WOB**

System 1

Individual BCIN: 32964

David DaCosta

Project # **PJ-00267**
Layout # **JB-09156**

DESIGN LOAD SPECIFICATIONS

Level 1 Net Load	19,173 btu/h
Level 2 Net Load	14,748 btu/h
Level 3 Net Load	14,766 btu/h
Level 4 Net Load	0 btu/h
Total Heat Loss	48,687 btu/h
Total Heat Gain	27,477 btu/h

Building Volume Vb	32411 ft³
Ventilation Load	1,336 Btu/h.
Ventilation PVC	79.5 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	0.0189 cfm/btuh
Cooling Air Flow Proportioning Factor	0.0335 cfm/btuh
R/A Temp	70 deg. F.
S/A Temp	128 deg. F.
Diffuser loss	0.01 "w.c.

FURNACE/AIR HANDLER DATA:

Make	Carrier
Model	59SC5B060E17--14
High Input	60000
High Output	58000
E.s.p.	0.50 " W.C.
Water Temp	deg. F.
AFUE	97%
Aux. Heat	
SB-12 Package	Energy Star
Temp. Rise>>>	58 deg. F.

BOILER/WATER HEATER DATA:

Make		Type	
Model			
Input Btu/h			
Output Btu/h			
Min. Output Btu/h		AWH	
Blower Speed Selected:	Orange	Blower Type	ECM
Check	920 cfm	Cool. Check	920 cfm
Heat.	920 cfm	Cooling	920 cfm
Design Airflow	920 cfm		

A/C UNIT DATA:

Carrier	2.5 Ton
Model:	
Cond.-----	2.5
Coil -----	2.5

	Level 1														Level 2													
S/A Outlet No.	1	2	3	4	5									6	7	8	9	10	11	12								
Room Use	BASE	BASE	BASE	BASE	F.AREA									KIT/FAM	KIT/FAM	KIT/FAM	LAUN	FOY	WR	GRT								
Btu/Outlet	4532	4532	4532	4532	1044									2062	2062	2062	2001	2779	586	3195								
Heating Airflow Rate CFM	86	86	86	86	20									39	39	39	38	53	11	60								
Cooling Airflow Rate CFM	30	30	30	30	2									78	78	78	61	40	12	92								
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					
Actual Duct Length	42	42	8	15	8									48	41	44	43	24	13	8								
Equivalent Length	140	150	110	90	120	70	70	70	70	70	70	70	70	110	90	100	110	70	100	130	70	70	70					
Total Effective Length	182	192	118	105	128	70	70	70	70	70	70	70	70	158	131	144	153	94	113	138	70	70	70					
Adjusted Pressure	0.07	0.07	0.11	0.12	0.10	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.08	0.10	0.09	0.08	0.14	0.12	0.09	0.19	0.19	0.19					
Duct Size Round	6	6	6	6	3									6	6	6	5	5	3	6								
Outlet Size	4x10	4x10	4x10	4x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	3x10	3x10	3x10	4x10	4x10	4x10	4x10					
Trunk	B	B	A	C	A									B	B	B	A	C	C	A								

	Level 3													Level 4													
S/A Outlet No.	13	14	15	16	17	18	19	20																			
Room Use	MAST	HALL	BED 4	BATH	BED 3	BATH 2	BED 2	ENS																			
Btu/Outlet	2612	1422	2862	1459	2393	994	1122	1901																			
Heating Airflow Rate CFM	49	27	54	28	45	19	21	36																			
Cooling Airflow Rate CFM	75	18	66	31	72	17	36	46																			
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	68	52	37	35	37	34	27	74																			
Equivalent Length	140	110	140	130	100	130	120	160	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70		
Total Effective Length	208	162	177	165	137	164	147	234	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70		
Adjusted Pressure	0.06	0.08	0.07	0.08	0.09	0.08	0.09	0.06	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	4	6	4	6	4	4	5																			
Outlet Size	4x10	3x10	4x10	3x10	4x10	3x10	3x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10		
Trunk	B	A	C	C	C	A	A	B																			

Return Branch And Grill Sizing	Grill Pressure Loss										
R/A Inlet No.	1R	2R	3R	4R	5R	6R	7R	8R	9R	10R	11R
Inlet Air Volume CFM	181	424	105	105	105						
Duct Design Pressure	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Actual Duct Length	8	12	38	40	48						
Equivalent Length	150	180	140	195	120	50	50	50	50	50	50
Total Effective Length	158	192	178	235	168	50	50	50	50	50	50
Adjusted Pressure	0.07	0.06	0.07	0.05	0.07	0.24	0.24	0.24	0.24	0.24	0.24
Duct Size Round	8.0	11.5	6.0	6.0	6.0						
Inlet Size	FLC	8	8	8	8						
" "	OR	x	x	x	x	x	x	x	x	x	x
Inlet Size	9x6	30	14	14	14						
Trunk	Z	Z	Z	Z							

Return Trunk Duct Sizing	CFM	Press.	Round	Rect. Size
Trunk				
Drop	920	0.05	15.5	24x10
Z	815	0.05	15.0	26x8 20x10
Y				
X				
W				
V				
U				
T				
S				
R				
Q				

Supply Trunk Duct Sizing	C.CFM	H.CFM	Press.	Round	Rect. Size
Trunk					
A	669	643	0.06	13.5	20x8 16x10
B	413	373	0.06	11.5	14x8 12x10
C	251	276	0.07	9.5	10x8 127
D					
E					
F					
G					
H					
I					
J					
K					

2012 OBC

Builder: EM Alr Systems

Date: September 21, 2023

Project: King East Developments

Model: Model 2700 WOB

System 1

Weather Data Richmond Hill 44 -5.8 88 20 50

Heat Loss ^T 77.8 deg. F Ht gain ^T 12.8 deg. F

Project # PJ-00267
Layout # JB-09156

Level 1

	BASE	F.AREA	A	A	A	A	A	A	A	A	A	A	A
Run ft. exposed wall A	116 A	10 A	A	A	A	A	A	A	A	A	A	A	A
Run ft. exposed wall B	33 B	B	B	B	B	B	B	B	B	B	B	B	B
Ceiling height	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG	6.0 AG
Floor area	925 Area	116 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	696	60											
Gross Exp Wall B	297												

Components	R-Values	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss	Gain
North Shaded	4.00	19.45	11.73	5	97	59											
East/West	4.00	19.45	29.66														
South	4.00	19.45	22.60	10	195	226											
WOB Windows Including Doors	4.00	19.45	27.86	53	1031	1477											
Skylight	2.03	38.33	89.12														
Doors	4.00	19.45	3.20	21	408	67											
Net exposed walls A	20.84	3.73	0.61	660		405	60										
Net exposed walls B	21.40	3.64	0.60	244		887	146										
Exposed Ceilings A	59.22	1.31	0.67														
Exposed Ceilings B	27.65	2.81	1.44														
Exposed Floors	29.80	2.61	0.23														
Foundation Conductive Heatloss																	
Total Conductive	Heat Loss																
	Heat Gain																
Air Leakage	Heat Loss/Gain	0.8824	0.0600	8298	143	478	2										
Ventilation	Case 1		0.07														
	Case 2		16.80														
	Case 3	x	0.05														
Heat Gain People			239	427	194	25	3										
Appliances Loads	1 =.25 percent		4352														
Duct and Pipe loss			10%														
Level HL Total	19,173			18129		1044											
Level HG Total	3,586				3531		55										

Level 2

	KIT/FAM	LAUN	FOY	WR	GRT	A	A	A	A	A	A	A	A
Run ft. exposed wall A	69 A	16 A	27 A	6 A	41 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	10.0	13.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Floor area	573 Area	67 Area	88 Area	31 Area	296 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	690	208	270	60	410								
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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		Loss	Gain		Loss	Gain		Loss	Gain		Loss	Gain		Loss	Gain		Loss	Gain
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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

Handwritten signature

David DaCosta

SB-12 Package

Energy Star

Total Heat Loss	48,687	btu/h
Total Heat Gain	27,477	btu/h

2012 OBC	Builder: EM Air Systems	Date: September 21, 2023	System 1	Weather Data	Richmond Hill	44	-5.8	88	20	50	Project #	PJ-00267
	Project: King East Developments	Model: Model 2700 WOB		Heat Loss ^T	77.8 deg. F	Ht gain ^T	12.8 deg. F				Layout #	JB-09156

Level 3				MAST		HALL		BED 4		BATH		BED 3		BATH 2		BED 2		ENS		A		A		A															
Run ft. exposed wall A				34	A	11	A	24	A	11	A	29	A	14	A	11	A	25	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	B																	
Ceiling height				9.0		9.0		9.0		9.0		9.0		9.0		9.0		9.0		9.0		9.0		9.0															
Floor area				302	Area	257	Area	180	Area	93	Area	180	Area	90	Area	151	Area	135	Area	Area	Area	Area																	
Exposed Ceilings A				302	A	257	A	180	A	93	A	180	A	90	A	151	A	135	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	B																	
Exposed Floors				Flr	Flr	60	Flr	180	Flr	93	Flr	9	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr	Flr																		
Gross Exp Wall A				306		99		216		99		261		126		99		225																					
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	4.00	19.45	11.73	24	467	712		11	214	129		25	486	742		15	292	445		33	642	979		9	175	203		16	311	362		24	467	712					
East/West	4.00	19.45	29.66																																				
South	4.00	19.45	22.60																																				
Existing Windows	1.99	39.10	24.56																																				
Skylight	2.03	38.33	89.12																																				
Doors	4.00	19.45	3.20																																				
Net exposed walls A	21.40	3.64	0.60	282	1025	169		88	320	53		191	694	114		84	305	50		228	829	136		117	425	70		83	302	50		201	731	120					
Net exposed walls B	8.50	9.15	1.51																																				
Exposed Ceilings A	59.22	1.31	0.67	302	397	203		257	338	173		180	236	121		93	122	63		180	236	121		90	118	60		151	198	101		135	177	91					
Exposed Ceilings B	27.65	2.81	1.44																																				
Exposed Floors	29.80	2.61	0.23					60	157	14		180	470	41		93	243	21		9	23	2																	
Foundation Conductive Heatloss																																							
Total Conductive	Heat Loss			1889				1028				1887		962						1731				719				811			1375								
	Heat Gain				1083			368				1018		579							1238				334			513			923								
Air Leakage	Heat Loss/Gain	0.3375	0.0600	637	65			347	22			637	61	325	35					584	74			243	20		274	31			464	55							
Ventilation	Case 1		0.03																																				
	Case 2		16.80																																				
	Case 3	x	0.05																																				
Heat Gain People																																							
Appliances Loads				1 =.25 percent																																			
Duct and Pipe loss																																							
Level HL Total	14,766	Total HL per room		2612				1422				2862		1459						2393				994			1122			1901									
Level HG Total	10,778	Total HG per room x 1.3			2229				546				1984		934						2148				495			1072				1369							

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	
North Shaded				4.00	19.45	11.73																			
East/West				4.00	19.45	29.66																			
South				4.00	19.45	22.60																			
Existing Windows				1.99	39.10	24.56																			
Skylight				2.03	38.33	89.12																			
Doors				4.00	19.45	3.20																			
Net exposed walls A				21.40	3.64	0.60																			
Net exposed walls B				8.50	9.15	1.51																			
Exposed Ceilings A				59.22	1.31	0.67																			
Exposed Ceilings B				27.65	2.81	1.44																			
Exposed Floors				29.80	2.61	0.23																			
Foundation Conductive Heatloss																									
Total Conductive		Heat Loss																							
		Heat Gain																							
Air Leakage		Heat Loss/Gain		0.0000	0.0600																				
Ventilation		Case 1		0.00	0.08																				
		Case 2		16.80	13.82																				
		Case 3		x	0.05	0.08																			
Heat Gain People						239																			
Appliances Loads				1 =.25 percent	4352																				
Duct and Pipe loss						10%																			
Level HL Total		0		Total HL for per room																					
Level HG Total		0		Total HG per room x 1.3																					

Total Heat Loss	48,687	btu/h
Total Heat Gain	27,477	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

David DaCosta

SB-12 Package

Energy Star

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Individual BCIN: 32964

David DaCosta

David DaCosta

Package: Energy Star
Project: Richmond Hill
Model: Model 2700 WOB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

For systems serving one dwelling unit & conforming to the Ontario Building Code, O.reg 332/12

Location of Installation	
Lot #	Plan #
Township	Richmond Hill
Roll #	Permit #
Address	

Builder	
Name	EM Air Systems
Address	
City	
Tel	Fax

Installing Contractor	
Name	
Address	
City	
Tel	Fax

Combustion Appliances 9.32.3.1(1)	
a) <input checked="" type="checkbox"/>	Direct vent (sealed combustion) only
b) <input type="checkbox"/>	Positive venting induced draft (except fireplaces)
c) <input type="checkbox"/>	Natural draft, B-vent or induced draft fireplaces
d) <input type="checkbox"/>	Solid fuel (including fireplaces)
e) <input type="checkbox"/>	No combustion Appliances

Heating System	
<input checked="" type="checkbox"/>	Forced air
<input type="checkbox"/>	Non forced air
<input type="checkbox"/>	Electric space heat (if over 10% of heat load)

House Type 9.32.3.1(2)	
I <input checked="" type="checkbox"/>	Type a) or b) appliances only, no solid fuel
II <input type="checkbox"/>	Type I except with solid fuel (including fireplace)
III <input type="checkbox"/>	Any type c) appliance
IV <input type="checkbox"/>	Type I or II either electric space heat
Other <input type="checkbox"/>	Type I, II or IV no forced air

System Design Option	
1 <input type="checkbox"/>	Exhaust only / forced air system
2 <input type="checkbox"/>	HRV WITH DUCTING / forced air system
3 <input checked="" type="checkbox"/>	HRV simplified connection to forced air system
4 <input type="checkbox"/>	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	3 @ 10.6 cfm	31.8 cfm	
Bathrooms & Kitchen	5 @ 10.6 cfm	53 cfm	
Other rooms	4 @ 10.6 cfm	42.4 cfm	
Total		169.6	

Principal Ventilation Capacity 9.32.3.4(1)			
Master bedroom	1 @ 31.8 cfm	31.8 cfm	
Other bedrooms	3 @ 15.9 cfm	47.7 cfm	
Total		79.5	

Principal Exhaust Fan Capacity			
Make	Model	Location	
VanEE	V150E75NS	Base	
127 cfm		80.0 Sones	or Equiv.

Heat Recovery Ventilator			
Make	VanEE		
Model	V150E75NS		
	127 cfm high	80 cfm low	
Sensible efficiency @ -25 deg C		60%	
Sensible efficiency @ 0 deg C		75%	

Note: Installer to balance HRV/ERV to within 10 percent of PVC

Supplemental Ventilation Capacity	
Total ventilation capacity	169.6
Less principal exhaust capacity	79.5
REQUIRED supplemental vent. Capacity	90.1 cfm

Supplemental Fans 9.32.3.5.			
Location	cfm	Model	Sones
Ens	50	XB50	0.3
Bath	50	XB50	0.3
all fans HVI listed			
	Make	Broan	or Equiv.

Designer Certification			
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.			
Name	David DaCosta		
Signature	<i>David DaCosta</i>		
HRAI #	5190	BCIN #	32964
Date	September 21, 2023		



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L4T 0A4 Tel: 905-671-9800 Fax: 647-494-9643
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Energy Efficiency Design Summary: Performance & Other Acceptable Compliance Methods (Building Code Part 9, Residential)

Page 7
Project # PJ-00267
Layout # JB-09156

This form is used by a designer to demonstrate that the energy efficiency design of a house complies with the building code using the Performance or Other Acceptable Compliance Methods described in Subsections 3.1.2. and 3.1.3. of SB-12,

This form must accurately reflect the information contained on the drawings and specifications being submitted. Refer to Supplementary Standard SB-12 for details about building code compliance requirements. Further information about energy efficiency requirements for new buildings is available from the provincial building code website or the municipal building department.

For use by Principal Authority

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

A. Project Information

Building number, street name	Unit number	Lot/Con
Model 2700 WOB		
Municipality	Postal code	Reg. Plan number / other description
Richmond Hill		

B. Prescriptive Compliance [indicate the building code compliance option being employed in the house design]

<input type="checkbox"/> SB-12 Performance* [SB-12 - 3.1.2.]	*Attach energy performance results using an approved software (see guide)
<input checked="" type="checkbox"/> ENERGY STAR** [SB-12 - 3.1.3.]	*Attach Builder Option Package [BOP] form
<input type="checkbox"/> R-2000** [SB-12 - 3.1.3.]	*Attach R-2000 HOT2000 Report

C. Project Building Design Conditions

Climatic Zone (SB-1):	Heat. Equip. Efficiency	Space Heating Fuel Source
<input checked="" type="checkbox"/> Zone 1 (< 5000 degree days)	<input checked="" type="checkbox"/> ≥ 92% AFUE	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Propane <input type="checkbox"/> Solid Fuel
<input type="checkbox"/> Zone 2 (≥ 5000 degree days)	<input type="checkbox"/> ≥ 84% < 92% AFUE	<input type="checkbox"/> Oil <input type="checkbox"/> Electric <input type="checkbox"/> Earth Energy
Ratio of Windows, Skylights & Glass (W, S & G) to Wall Area	Other Building Characteristics	
Area of Walls = <u>382.9</u> m ² or <u>4121.9</u> ft ²	<input type="checkbox"/> Log/Post&Beam <input type="checkbox"/> ICF Above Grade <input type="checkbox"/> ICF Basement	
Area of W, S & G = <u>34.84</u> m ² or <u>375.0</u> ft ²	<input type="checkbox"/> Slab-on-ground <input checked="" type="checkbox"/> Walkout Basement	
	<input checked="" type="checkbox"/> Air Conditioning <input type="checkbox"/> Combo Unit	
	<input type="checkbox"/> Air Sourced Heat Pump (ASHP)	
<input type="checkbox"/> Ground Source Heat Pump (GSHP)		

SB-12 Performance Reference Building Design Package indicating the prescriptive package to be compared for compliance

SB-12 Referenced Building Package (input design package):

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

Building Component	Minimum RSI/R-Values or Maximum U-Value ¹		Building Component	Efficiency Ratings
Thermal Insulation	Nominal	Effective	Windows & Doors Provide U-Value ⁽¹⁾ or ER rating	
Ceiling with Attic Space	60	59.22	Windows/Sliding Glass Doors	1.4
Ceiling without Attic Space	31	27.65	Skylights	2.8
Exposed Floor	31	29.80	Mechanicals	
Walls Above Grade	22 +5.0ci	21.40	Heating Equip.(AFUE)	96%
Basement Walls	20.0ci	20.84	HRV Efficiency (SRE% at 0°C)	75%
Slab (all >600mm below grade)	x	x	DHW Heater (EF)	0.95
Slab (edge only ≤600mm below grade)	10	11.13	DWHR (CSA B55.1 (min. 42% efficiency))	42.0% #Showers 2
Slab (all ≤600mm below grade, or heated)	10	11.13	Combined Heating System	

(1) U value to be provided in either W/(m²·K) or Btu/(h·ft²·F) but not both.



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Project # PJ-00267
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E. Project Design Verification [Subsection 3.1.2. Performance Compliance]

The annual energy consumption using Subsection 3.1.1. SB-12 Reference Building Package is _____ GJ (1J=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 tightness baseline of:

- ☐ OBC reference ACH, NLA or NLR default values (no depressurization test required)
- ☐ Targeted ACH, NLA or NLR. Depressurization test to meet _____ ACH50 or NLR or NLA
- ☐ Reduction of overall thermal performance of the proposed building envelope is not more than 25% of the envelope of the compliance package it is compared against (3.1.2.1.(6)).
- ☐ Standard Operating Conditions Applied (A-3.1.2.1 - 4.6.2)
- ☐ Reduced Operating Conditions for Zero-rated homes Applied (A-3.1.2.1 - 4.6.2.5)

☐ On Site Renewable(s): Solar: _____
Other Types: _____

F. ENERGY STAR or R-2000 Performance Design Verification [Subsection 3.1.3. Other Acceptable Compliance Methods]

- ☐ The NRCAN "ENERGY STAR for New Homes Standard Version 12.6" technical requirements, applied to this building design result in the building performance meeting or exceeding the prescriptive performance requirements of the Supplementary Standard SB12 (A-3.1.3.1).
- ☐ The NRCAN, "2012 R-2000 Standard" technical requirements, applied to this building design result in the building performance meeting or exceeding the prescriptive performance requirements of the Supplementary Standard SB12 (A-3.1.3.1).

Performance Energy Modeling Professional

Energy Evaluator/Advisor/Rater/CEM Name and company: BUILDING KNOWLEDGE CANADA
Accreditation or Evaluator/Advisor/Rater License #: 5506

ENERGY STAR or R-2000

Energy Evaluator/Advisor/Rater/Name and company: ANGELA BUSTAMANTE
Evaluator/Advisor/Rater License #: 5506

G. Designer(s) [name(s) & BCIN(s), if applicable, of person(s) providing information herein to substantiate that design meets building code]

Name	BCIN	Signature
David DaCosta	32964	



50 Fleming Drive, Unit # 6, Cambridge, ON, N1T 2B1

T | 1-800-267-6830

F | 519-658-6103 E | info@buildingknowledge.ca

ENERGY STAR® for New Homes
Version Ontario 17.1 Revision 2
BOP Form Zone 1 Ontario



General Details		House Details	
Performance or Prescriptive :	Prescriptive	ESEnrolment ID:	
Attached or Detached or MURB :	Detached	Site/Phase:	KING EAST PH 2&3
Province / Territory :	ON	LOT :	
Zone :	Zone 1 Heating Degree Days	Street # and Name:	
Service Organization (SO) number :	55 - Enerquality	Street Type:	
Builder number :	TBD	City :	RICHMOND HILL
Builder Name:	PLAZACORP	Postal Code (or FSA) :	
		Model:	ALL MODELS
Supplementary Information		Third Party Evaluator:	BUILDING KNOWLEDGE CANADA
		Evaluator Name:	ANGELA BUSTAMANTE
		Evaluator Number:	5506

Building Component	Core / Option	BOP Selection Description	BOP Option Credits	Measure Selected (Check)	Nominal Efficiency Values (Optional)	Notes (Optional)
				✓		
Ceilings Below Attic	Core	RSI 10.43 (R 59.2)	Core Minimum	✓	R60	
	Option	N/A	n/a			
Cathedral Ceilings and Flat Roofs	Core	RSI 4.87 (R 27.7)	Core Minimum	✓	R31	
	Option	N/A	n/a			
Ceilings Below Attic and Cathedral Ceilings/Flat Roofs	Option	N/A	n/a			
Walls Above Grade	Core	RSI 3.08 (R 17.5)	Core Minimum			
	Option	RSI 3.72 (R 21.1)	0.7	✓	R22+R5	
Floors Over Unheated Spaces	Core	RSI 5.25 (29.8)	Core Minimum	✓	R31	
Foundation Walls Below or in Contact with the Ground	Core	RSI 3.72 (R 21.1) below grade	Core Minimum	✓	R20 blanket	
	Option	N/A	n/a			
Unheated Floors on Ground Above Frost Line	Core	RSI 1.96 (R 11.1)	Core Minimum	✓	R10 if applicable	
Unheated Floors on Ground Below Frost Line	Option	N/A	n/a			
Heated Floors on Ground	Core	N/A	n/a			
Slabs on Grade with Integral Footing	Core	N/A	n/a			
Windows (Fenestrations)	Core	ENERGY STAR Zone 2 UV1.4 and/or ER29	Core Minimum	✓	Zone 2	
	Option	N/A	n/a			
	Core	Total area of all windows to max. 20% of above grade wall area.	Core Minimum	✓		
Fireplace	Core	Gas fireplace spark ignition if installed	#N/A	✓		
Space Heating	Core	Min. 96% AFUE ENERGY STAR fuel fired furnace	Core Minimum	✓		
	Req'd	Supply ducts and 1m return sealed	Required	✓		
Domestic Water Heating	Core	Instantaneous min. EF or UEF 0.80 Tank EF or UEF 0.80 (direct vent (sealed))	Core Minimum			
	Option	Instantaneous condensing min. UEF 0.95	0.4	✓		
Drain Water Heat Recovery	Option	≥ 42% to ≤ 54% - two showers	0.3	✓	42%	
Airtightness	Core	Level 1 (DT 2.5ach / 0.18 nlr) (AT 3.0ach/0.26nlr)	Core Minimum	✓		
	Option	N/A	n/a			
Ventilation (HRV / ERV)	Core	65% SRE @0 °C and 55% SRE @ -25 °C	Core Minimum			
	Option	≥75% SRE @ 0 °C	0.2	✓		
	Req'd	Interconnected to the Furnace Fan	Required	✓		
	Req'd	HRV balanced	Required	✓		
Electrical Savings	Electrical	SRE ≥75% SRE @ 0 °C, ≥ 0.57 L/s/W	0.1	✓		
	Core	75% ENERGY STAR lighting	Core Minimum			
	Option	100% ENERGY STAR lighting	0.1	✓		
ENERGY STAR Certified Appliances	Option	N/A	n/a			

NOTE: Thermal resistance values under "BOP Selection Description" are listed in effective values, unless indicated with "nominal".

Total BOP Option Credits (Must be ≥ 1.8 Credits)

1.8

Package: Energy Star **System:** System 1
Project: Richmond Hill **Model:** Model 2700 WOB

Air Leakage Calculations

Building Air Leakage Heat Loss				
B	LRairh	Vb	HL^T	HLleak
0.018	0.387	32411	77.8	17552

Building Air Leakage Heat Gain				
B	LRairh	Vb	HG^T	HG Leak
0.018	0.108	32411	12.8	809

Air Leakage Heat Loss/Gain Multiplier Table (Section 11)				
Level	Level Factor (LF)	Building Air	Level Conductive Heat Loss (HLclevel)	Air Leakage Heat Loss Multiplier
Level 1	0.5	17552	9946	0.8824
Level 2	0.3		9070	0.5805
Level 3	0.2		10402	0.3375
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	
	809		0.0600
BUILDING CONDUCTIVE HEAT GAIN			
	13497		

Levels this Dwelling	
	3

Highest Ceiling Height		28.0 FT	8.53 M
------------------------	--	---------	--------

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	79.5	77.8	0.20	1336	1.1	79.5	12.8	1099		
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	1099	0.08			
	Level 1	0.5	1336	9946	0.07	Building	13497				
	Level 2	0.3		9070	0.04						
	Level 3	0.2		10402	0.03						
	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	16.80		C	HG^T	13.82			
	1.08	77.8	0.20			1.08	12.8				
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		1336	0.05		HGbvent	HG*1.3	1099	0.08		
						1099	1				

Foundation Conductive Heatloss Level 1	Level 1	2000	Watts	6824	Btu/h
Foundation Conductive Heatloss Level 2	Level 2		Watts		Btu/h
Slab on Grade Foundation Conductive Heatloss			Watts		Btu/h
Walk Out Basement Foundation Conductive Heatloss		148	Watts	504	Btu/h

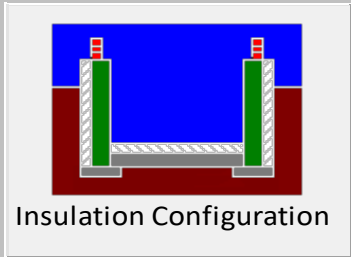
Envelope Air Leakage Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario ▼			
Region:	Richmond Hill ▼			
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):	8.53			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Shallow			
House Volume (m ³):	917.88			
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:	
	39.75		39.75	
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Heating Air Leakage Rate (ACH/H):		0.387		
Cooling Air Leakage Rate (ACH/H):		0.108		

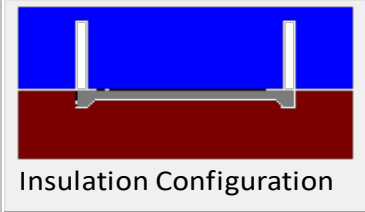
Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario ▼	
Region:	Richmond Hill ▼	
Site Description		
Soil Conductivity:	High conductivity: moist soil ▼	
Water Table:	Normal (7-10 m, 23-33 Ft) ▼	
Foundation Dimensions		
Floor Length (m):	18.75	 <p>Insulation Configuration</p>
Floor Width (m):	4.88	
Exposed Perimeter (m):	38.40	
Wall Height (m):	2.74	
Depth Below Grade (m):	0.91	
Window Area (m ²):	1.39	
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):		2000

Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	▼
Region:	Richmond Hill	▼
Site Description		
Soil Conductivity:	High conductivity: moist soil	▼
Water Table:	Normal (7-10 m, 23-33 Ft)	▼
Floor Dimensions		
Length (m):	8.69	 Insulation Configuration
Width (m):	0.61	
Exposed Perimeter (m):	10.06	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		148



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Effective R-Value Calculations

Effective R-Value - Above Grade Walls	
Insulation	R22+5ci
Exterior Air Film	0.17
Hollow Vinyl Siding	0.62
Continuous Insulation	5.00
Effective Cavity Insulation	14.49
Drywall	0.44
Interior Air Film	0.68
Effective R-Value	21.40

Effective R-Value - Below Grade Walls	
Insulation	R20ci
Concrete Foundation	0.44
Interior Air Film	0.68
Continuous Insulation	20.0
Effective R-Value	21.12

Effective R-Value – Exposed Floors	
Insulation	R31
Exterior Air Film	0.17
Effective Cavity Insulation	28.72
Interior Air Film	0.91
Continuous Insulation	0.00
Effective R-Value	29.80



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

Tel: 905-671-9800 email: hvac@gtadesigns.ca

Effective R-Value – Exposed Ceiling with Attic

Insulation	R60
Exterior Air Film	0.17
Effective Insulation	58.61
Drywall	0.44
Effective R-Value	59.22

Effective R-Value – Exposed Ceiling with Flat Roofs

Insulation	R31
Exterior Air Film	0.17
Effective Insulation	27.04
Drywall	0.44
Effective R-Value	27.65

	FLEX DUCT		LOW/HIGH WALL/KICK SUPPLY DIFFUSER		DUCT CONNECTION TO JOIST LINING		RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)	S.A.	SUPPLY AIR
	RIGID ROUND DUCT		HRV EXHAUST GRILLE		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

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

FURNACE EQUIPPED WITH BRUSHLESS DC MOTOR AS PER OBC 12.3.1.5 (2) & CSA P.9-II CERTIFIED

INSULATE ALL DUCTS IN UNCONDITIONED SPACES MIN. R12

ALL R.A. STUD OPENINGS ON THE GROUND FLOOR AND SECOND FLOOR TO BE AT LEAST 14X5.5 AND 14X3.25 RESPECTIVELY

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

ENERGY STAR SEAL ALL JOINTS ON ANY DUCTWORK. SEAL FURNACE VENTS, A/C PIPING AND HRV DUCTS AT EXTERIOR WALLS

ENERGY STAR VI2 STANDARD. ALL DUCTS SHALL BE LOCATED WITHIN HEATED BOUNDARY (4.7.2.2.)

P.E. HRV VANE # VI50E75NS 127 CFM @ .4 W.C

2-6" L/W

6-6"

7-6"

8-6"

13-6"

20

1-6"

B - 14 X 8

BASEMENT

3-6"

12-6"

3 FLOORS

ROUGHED-IN

FINISHED AREA

UP 14R

HANDRAIL

5R-6"

14

9

A - 20 X 8

5

IR-8" FLC OR 9X6

3R-6"

15-6"

16

4R-6"

11

2R

C - 10 X 8

4-6"

17-6"

10

UNEXCAVATED

COLD CELLAR

6" MINIMUM HORIZONTAL SEPARATION BETWEEN HOODS, OR OTHER CODE APPROVED METHOD

OPTIONAL TIMER/CONTROL

CAREFULLY INSULATE DUCTS ON COLD SIDE OF SYSTEM

STALE AIR FROM KITCHEN AND BATHROOM

STALE AIR EXHAUST

FRESH AIR INLET

HEAT EXCHANGE CORE

FRESH AIR TO LIVING SPACE AND BEDROOMS OPTION 3

FURNACE OR AIR HANDLER


RETURN AIR

SIMPLIFIED CONNECTION TO FURNACE AIR SYSTEM HRV DIAGRAM OPTION 3

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

BASEMENT FLOOR PLAN 'A''B''C''D'

OBC 2012

ZONE I COMPLIANCE
PACKAGE "ENERGY STAR" REF. TABLE 3.1.3.

NOTES

INSTALLATION TO COMPLY WITH THE LATEST ONTARIO BUILDING CODE.

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

PROVIDE BALANCING DAMPERS ON ALL BRANCHES.

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

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

CONTRACTOR MUST WORK FROM APPROVED PLANS.

ANY ALTERATIONS TO THIS ORIGINAL PLAN ARE NOT THE RESPONSIBILITY 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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EMAIL: DAVE@GTADESIGNS.CA
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HEAT-LOSS	43,162	BTU/HR.
UNIT MAKE	CARRIER	OR EQUAL.
UNIT MODEL	59SC5B060E17--14	OR EQUAL.
UNIT HEATING INPUT	60,000	BTU/HR.
UNIT HEATING OUTPUT	58,000	BTU/HR.
A/C COOLING CAPACITY	2.5	TONS.
FAN SPEED	920	CFM

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	8	3	3
1ST FLOOR	7	1	2
BASEMENT	5	1	

FLOOR PLAN: BASEMENT	
DRAWN BY: JL	CHECKED: DD
LAYOUT NO. JB-09127	DRAWING NO. MI
2700	

DATE:	SEPTEMBER 21, 2023
CLIENT:	EM AIR SYSTEMS
MODEL:	MODEL 2700
PROJECT:	KING EAST DEVELOPMENTS RICHMOND HILL, ONT.
SCALE:	3/16" = 1'-0"

	FLEX DUCT		LOW/HIGH WALL/KICK SUPPLY DIFFUSER		DUCT CONNECTION TO JOIST LINING		RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)	S.A.	SUPPLY AIR
	RIGID ROUND DUCT		HRV EXHAUST GRILLE		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

KITCHEN EXHAUST
100 CFM MIN. 6"
ALL OTHER FANS SHALL BE
A MIN. OF 50 CFM OR
OTHERWISE NOTED
AS PER 9.32.3.5

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

CIRCULATION PRINCIPAL
FAN SWITCH
TO BE CENTRALLY
LOCATED

INSULATE ALL DUCTS IN
UNCONDITIONED
SPACES MIN. R12

ALL R.A. STUD OPENINGS
ON THE GROUND FLOOR
AND SECOND FLOOR TO BE
AT LEAST 14X5.5 AND
14X3.25 RESPECTIVELY

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

ENERGY STAR
SEAL ALL JOINTS ON ANY
DUCTWORK.
SEAL FURNACE VENTS, A/C
PIPING AND HRV DUCTS AT
EXTERIOR WALLS

ENERGY STAR VI2 STANDARD.
ALL DUCTS SHALL BE LOCATED
WITHIN HEATED BOUNDARY
(4.7.2.2.)

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

FIRST FLOOR PLAN 'A"B"C'

OBC 2012

ZONE I COMPLIANCE
PACKAGE "ENERGY STAR" REF. TABLE 3.1.3.

NOTES

INSTALLATION TO COMPLY WITH THE LATEST ONTARIO
BUILDING CODE.

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

PROVIDE BALANCING DAMPERS ON ALL BRANCHES.

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

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

CONTRACTOR MUST WORK FROM APPROVED PLANS.

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

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



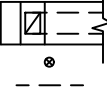














**2985 DREW ROAD
SUITE 202,
MISSISSAUGA, ONT.
L4T 0A4 TEL: 905-671-9800
EMAIL: DAVE@GTADESIGNS.CA
WEB: WWW.GTADESIGNS.CA**

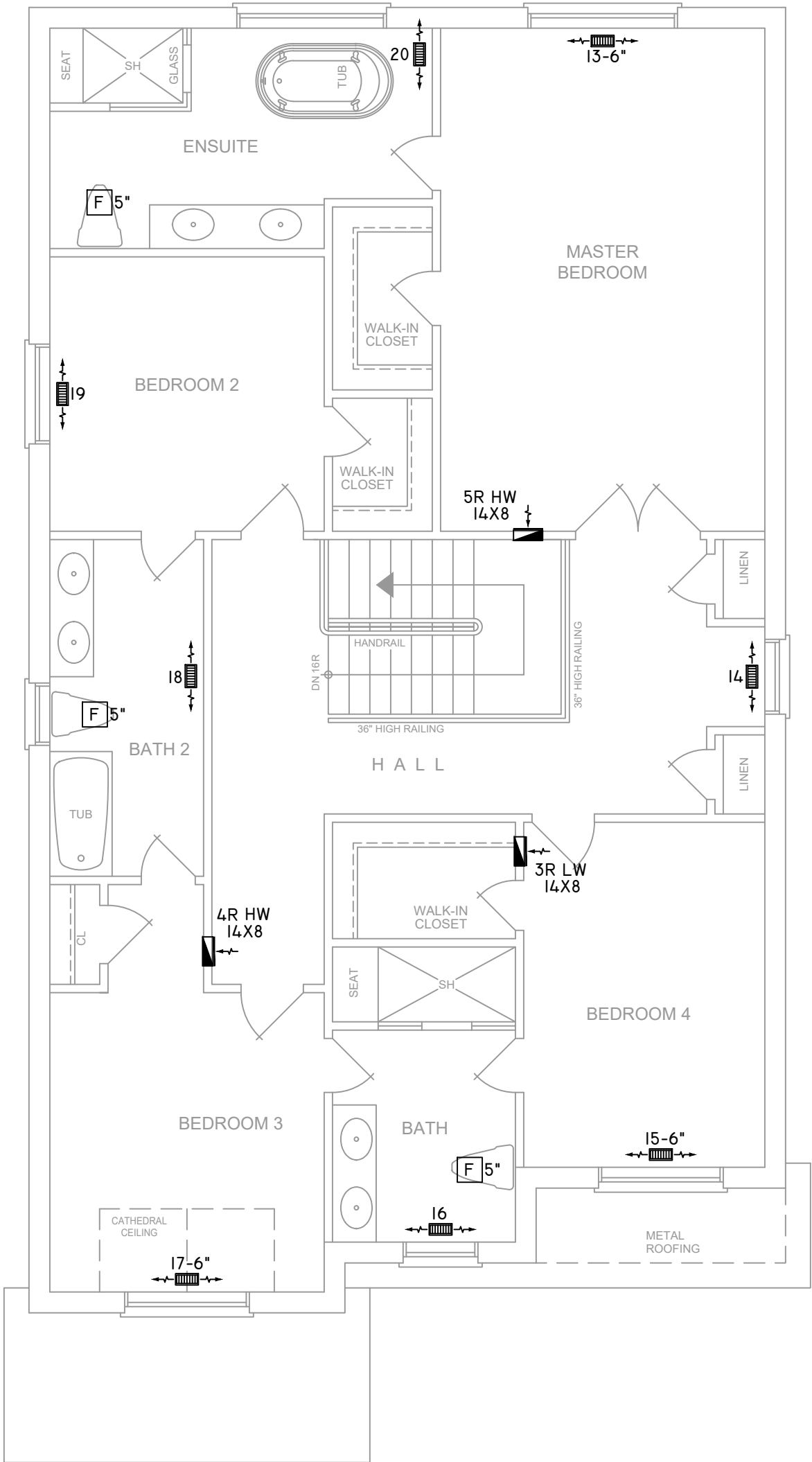
HEAT-LOSS	43,162	BTU/HR.
UNIT MAKE	CARRIER	OR EQUAL.
UNIT MODEL	59SC5B060E17--14	OR EQUAL.
UNIT HEATING INPUT	60,000	BTU/HR.
UNIT HEATING OUTPUT	58,000	BTU/HR.
A/C COOLING CAPACITY	2.5	TONS.
FAN SPEED	920	CFM

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	8	3	3
1ST FLOOR	7	1	2
BASEMENT	5	1	

FLOOR PLAN: GROUND FLOOR		
DRAWN BY: JL	CHECKED: DD	SQFT 2700
LAYOUT NO. JB-09127	DRAWING NO. M2	

DATE:	SEPTEMBER 21, 2023
CLIENT:	EM AIR SYSTEMS
MODEL:	MODEL 2700
PROJECT:	KING EAST DEVELOPMENTS RICHMOND HILL, ONT.
SCALE:	3/16" = 1'-0"

	FLEX DUCT		LOW/HIGH WALL/KICK SUPPLY DIFFUSER		DUCT CONNECTION TO JOIST LINING		RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)	S.A.	SUPPLY AIR
	RIGID ROUND DUCT		HRV EXHAUST GRILLE		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



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

INSULATE ALL DUCTS IN
UNCONDITIONED
SPACES MIN. R12

ALL R.A. STUD OPENINGS
ON THE GROUND FLOOR
AND SECOND FLOOR TO BE
AT LEAST 14X5.5 AND
14X3.25 RESPECTIVELY

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

ENERGY STAR
SEAL ALL JOINTS ON ANY
DUCTWORK.
SEAL FURNACE VENTS, A/C
PIPING AND HRV DUCTS AT
EXTERIOR WALLS

ENERGY STAR V12 STANDARD.
ALL DUCTS SHALL BE LOCATED
WITHIN HEATED BOUNDARY
(4.7.2.2.)

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

SECOND FLOOR PLAN 'A' 'B' 'C'

OBC 2012

ZONE I COMPLIANCE
PACKAGE "ENERGY STAR" REF. TABLE 3.1.3.

NOTES

INSTALLATION TO COMPLY WITH THE LATEST ONTARIO
BUILDING CODE.
ALL SUPPLY OUTLETS TO BE 5" DIA. UNLESS OTHERWISE
SPECIFIED.
PROVIDE BALANCING DAMPERS ON ALL BRANCHES.
ALL R/A PARTITIONS 6" (FIRST FLOOR ONLY)
INSULATE DUCTS IN UNCONDITIONED SPACES R12 UNDERCUT
ALL DOORS 1" MIN.
CONTRACTOR MUST WORK FROM APPROVED PLANS.
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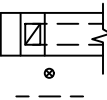













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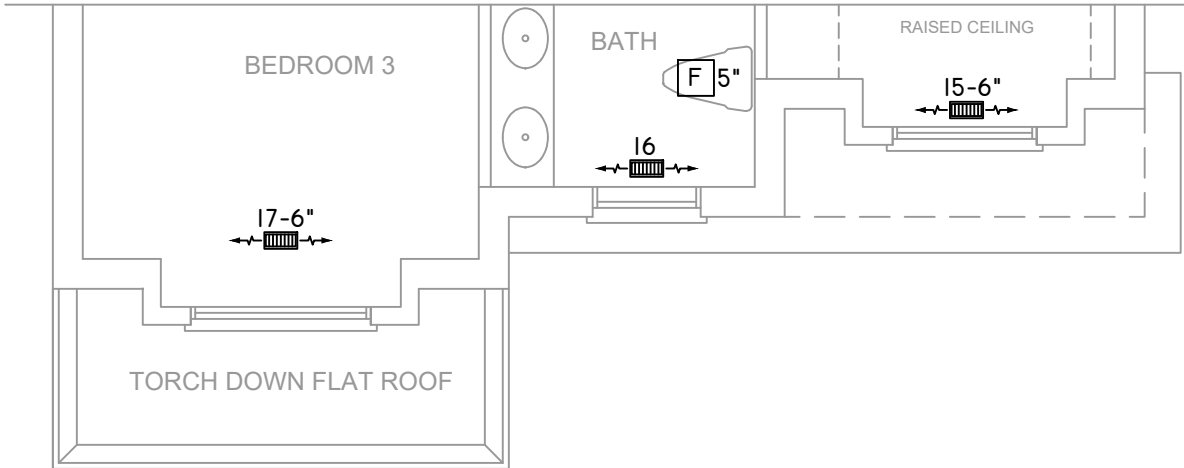
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UNIT MODEL	59SC5B060E17--14	OR EQUAL.
UNIT HEATING INPUT	60,000	BTU/HR.
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A/C COOLING CAPACITY	2.5	TONS.
FAN SPEED	920	CFM

# OF RUNS	S/A	R/A	FANS
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BASEMENT	5	1	

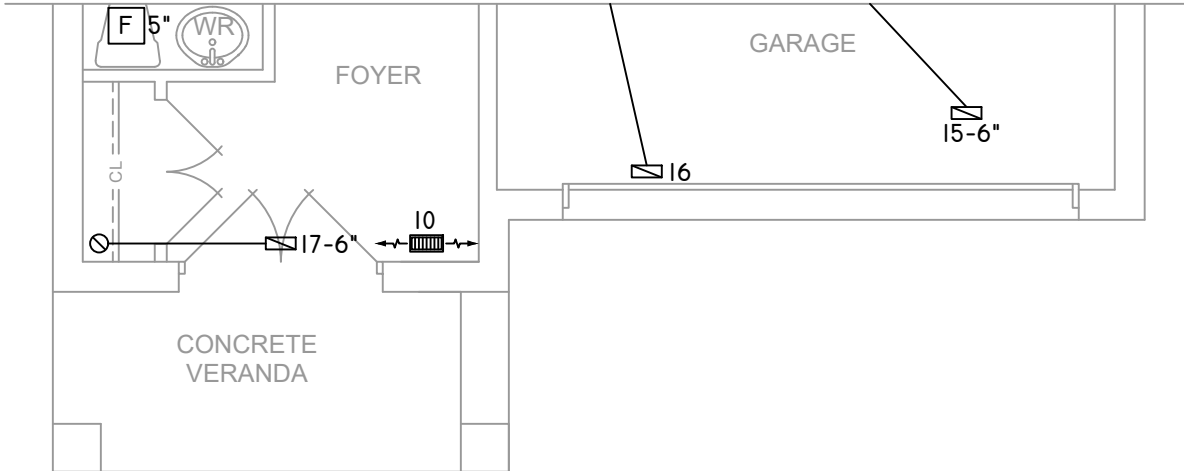
FLOOR PLAN: SECOND FLOOR		
DRAWN BY: JL	CHECKED: DD	SQFT 2700
LAYOUT NO. JB-09127	DRAWING NO. M3	

DATE:	SEPTEMBER 21, 2023
CLIENT:	EM AIR SYSTEMS
MODEL:	MODEL 2700
PROJECT:	KING EAST DEVELOPMENTS RICHMOND HILL, ONT.
SCALE:	3/16" = 1'-0"

	FLEX DUCT		LOW/HIGH WALL/KICK SUPPLY DIFFUSER		DUCT CONNECTION TO JOIST LINING		RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)	S.A.	SUPPLY AIR
	RIGID ROUND DUCT		HRV EXHAUST GRILLE		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



SECOND FLOOR PLAN 'D'




FIRST FLOOR PLAN 'D'

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 I COMPLIANCE
PACKAGE "ENERGY STAR" REF. TABLE 3.1.3.

NOTES
INSTALLATION TO COMPLY WITH THE LATEST ONTARIO BUILDING CODE.
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PROVIDE BALANCING DAMPERS ON ALL BRANCHES.
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A/C COOLING CAPACITY	2.5	TONS.
FAN SPEED	920	CFM

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	8	3	3
1ST FLOOR	7	1	2
BASEMENT	5	1	

FLOOR PLAN:		
PARTIAL PLAN(S)		
DRAWN BY: JL	CHECKED: DD	SQFT 2700
LAYOUT NO. JB-09127	DRAWING NO. M4	

DATE:	SEPTEMBER 21, 2023
CLIENT:	EM AIR SYSTEMS
MODEL:	MODEL 2700
PROJECT:	KING EAST DEVELOPMENTS RICHMOND HILL,ONT.
SCALE:	3/16" = 1'-0"