


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

<b>A. Project Information</b>					
Building number, street name				Lot:	
<b>Model 2010</b>				Lot/con.	
Municipality		Postal code	Plan number/ other description		
Richmond Hill					
<b>B. Individual who reviews and takes responsibility for design activities</b>					
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@gtadesigns.ca	
Telephone number		Fax number		Cell number	
(905) 671-9800					
<b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 of Division C]</b>					
<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					
<b>Description of designer's work</b>				<b>Model Certification</b>	
				Project #: PJ-00267	
				Layout #: JB-09141	
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	1807	Model	Model 2010
Residential System Design per CAN/CSA-F280-12				SB-12	Energy Star
Residential New Construction - Forced Air					
<b>D. Declaration of Designer</b>					
I, <u>David DaCosta</u> declare that (choose one as appropriate): (print name)					
<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. Individual BCIN: _____ Firm BCIN: _____					
<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. Individual BCIN: <u>32964</u> Basis for exemption from registration: <u>Division C 3.2.4.1. (4)</u>					
<input type="checkbox"/> 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>September 15, 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.

<b>Heat loss and gain calculation summary sheet</b>				CSA-F280-M12 Standard Form No. 1	
These documents issued for the use of <b>EM Air Systems</b>				Layout No.	
and may not be used by any other persons without authorization. Documents for permit and/or construction are signed in red.				<b>JB-09141</b>	
<b>Building Location</b>					
Address (Model): <b>Model 2010</b>			Site: <b>King East Developments</b>		
Model:			Lot:		
City and Province: <b>Richmond Hill</b>			Postal code:		
<b>Calculations based on</b>					
Dimensional information based on:			<b>Architectural Design Inc. Jun/2023</b>		
Attachment: <b>Townhome</b>			Front facing: <b>East/West</b>		Assumed? <b>Yes</b>
No. of Levels: <b>3</b> Ventilated? <b>Included</b>			Air tightness: <b>1961-Present (ACH=3.57)</b>		Assumed? <b>Yes</b>
Weather location: <b>Richmond Hill</b>			Wind exposure: <b>Sheltered</b>		
HRV? <b>VanEE</b> <b>V150E75NS</b>			Internal shading: <b>Light-translucent</b>		Occupants: <b>4</b>
Sensible Eff. at -25C <b>60%</b>		Apparent Effect. at -0C <b>80%</b>		Units: <b>Imperial</b>	Area Sq ft: <b>1807</b>
Sensible Eff. at -0C <b>75%</b>					
<b>Heating design conditions</b>			<b>Cooling design conditions</b>		
Outdoor temp <b>-5.8</b> Indoor temp: <b>72</b> Mean soil temp: <b>50</b>			Outdoor temp <b>88</b> Indoor temp: <b>75</b> Latitude: <b>44</b>		
<b>Above grade walls</b>			<b>Below grade walls</b>		
Style A: <b>As per OBC SB12</b> <b>Energy Star</b> <b>R 22 + 5ci</b>			Style A: <b>As per OBC SB12</b> <b>Energy Star</b> <b>R 20ci</b>		
Style B:			Style B:		
Style C:			Style C:		
Style D:			Style D:		
<b>Floors on soil</b>			<b>Ceilings</b>		
Style A: <b>As per Selected OBC SB12</b> <b>Energy Star</b>			Style A: <b>As per Selected OBC SB12</b> <b>Energy Star</b> <b>R 60</b>		
Style B:			Style B: <b>As per Selected OBC SB12</b> <b>Energy Star</b> <b>R 31</b>		
<b>Exposed floors</b>			Style C:		
Style A: <b>As per Selected OBC SB12</b> <b>Energy Star</b> <b>R 31</b>			<b>Doors</b>		
Style B:			Style A: <b>As per Selected OBC SB12</b> <b>Energy Star</b> <b>R 4.00</b>		
<b>Windows</b>			Style B:		
Style A: <b>As per Selected OBC SB12</b> <b>Energy Star</b> <b>R 4.00</b>			Style C:		
Style B:			<b>Skylights</b>		
Style C:			Style A: <b>As per Selected OBC SB12</b> <b>Energy Star</b> <b>R 2.03</b>		
Style D:			Style B:		
Attached documents: <b>As per Shedule 1</b>		<b>Heat Loss/Gain Caculations based on CSA-F280-12 Effective R-Values</b>			
Notes: <b>Residential New Construction - Forced Air</b>					
<b>Calculations performed by</b>					
Name: <b>David DaCosta</b>			Postal code: <b>L4T 0A4</b>		
Company: <b>gtaDesigns Inc.</b>			Telephone: <b>(905) 671-9800</b>		
Address: <b>2985 Drew Road, Suite 202</b>			Fax:		
City: <b>Mississauga</b>			E-mail <b>hvac@gtadesigns.ca</b>		

Builder: **EM Air Systems**

Date: **September 15, 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 2010**

**System 1**

Individual BCIN: 32964

David DaCosta

Project # **PJ-00267**  
Layout # **JB-09141**

DESIGN LOAD SPECIFICATIONS		AIR DISTRIBUTION & PRESSURE		FURNACE/AIR HANDLER DATA:		BOILER/WATER HEATER DATA:		A/C UNIT DATA:	
Level 1 Net Load	12,984 btu/h	Equipment External Static Pressure	0.5 "w.c.	Make	Carrier	Make	Type	Carrier	2.0 Ton
Level 2 Net Load	8,856 btu/h	Additional Equipment Pressure Drop	0.225 "w.c.	Model	59SC5B040E14--10	Model		Model:	
Level 3 Net Load	7,222 btu/h	Available Design Pressure	0.275 "w.c.	High Input	40000	Input Btu/h		Cond.-----	2.0
Level 4 Net Load	0 btu/h	Return Branch Longest Effective Length	300 ft	High Output	39000	Output Btu/h		Coil -----	2.0
Total Heat Loss	29,063 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	18,433 btu/h	S/A Plenum Pressure	0.14 "w.c.	Water Temp	deg. F.	Blower DATA:			
		Heating Air Flow Proportioning Factor	0.0277 cfm/btuh	AFUE	98%	Blower Speed Selected:	Yellow	Blower Type	ECM
Building Volume Vb	21401 ft³	Cooling Air Flow Proportioning Factor	0.0437 cfm/btuh	Aux. Heat		(Brushless DC OBC 12.3.1.5.(2))			
Ventilation Load	1,069 Btu/h.	R/A Temp	70 deg. F.	SB-12 Package	Energy Star	Check	805 cfm	Cool. Check	805 cfm
Ventilation PVC	63.6 cfm	S/A Temp	115 deg. F.			Heat.	805 cfm	Cooling	805 cfm
Supply Branch and Grill Sizing		Diffuser loss	0.01 "w.c.	Temp. Rise>>>	45 deg. F.			Design Airflow	805 cfm

	Level 1														Level 2													
S/A Outlet No.	1	2	3	4	5	6	7							8	9	10	11	12										
Room Use	REC	REC	WR 2	F.BASE	STOR	FURN	OFF							GRT/KIT	GRT/KIT	FOY	FAM	FAM										
Btu/Outlet	1616	1616	172	3232	3104	1380	1864							1740	1740	2181	1597	1597										
Heating Airflow Rate CFM	45	45	5	90	86	38	52							48	48	60	44	44										
Cooling Airflow Rate CFM	24	24	0	8	6	2	18							81	81	56	88	88										
Duct Design Pressure	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13		
Actual Duct Length	36	47	18	17	25	6	37							24	36	34	34	36										
Equivalent Length	120	100	90	80	90	100	110	70	70	70	70	70	70	90	80	120	110	120	70	70	70	70	70	70	70	70		
Total Effective Length	156	147	108	97	115	106	147	70	70	70	70	70	70	114	116	154	144	156	70	70	70	70	70	70	70	70		
Adjusted Pressure	0.08	0.09	0.12	0.13	0.11	0.12	0.09	0.19	0.19	0.19	0.19	0.19	0.19	0.11	0.11	0.08	0.09	0.08	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19		
Duct Size Round	5	5	2	6	6	4	5							6	6	5	6	6										
Outlet Size	3x10	3x10	3x10	4x10	4x10	3x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10		
Trunk	B	A	C	C	D	A	B							B	A	D	D	D										

	Level 3														Level 4													
S/A Outlet No.	13	14	15	16	17	18	19																					
Room Use	MAST	MAST	ENS	LAUN	BED 3	BED 2	BATH																					
Btu/Outlet	1085	1085	1335	89	1570	1924	135																					
Heating Airflow Rate CFM	30	30	37	2	43	53	4																					
Cooling Airflow Rate CFM	51	51	56	2	77	88	3																					
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	33	41	51	27	60	51	26																					
Equivalent Length	100	120	110	100	160	150	120	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70			
Total Effective Length	133	161	161	127	220	201	146	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70			
Adjusted Pressure	0.10	0.08	0.08	0.10	0.06	0.06	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	0.19			
Duct Size Round	5	5	5	2	6	6	2																					
Outlet Size	3x10	3x10	3x10	3x10	4x10	4x10	3x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10	4x10			
Trunk	B	B	A	C	D	D	C																					

Return Branch And Grill Sizing		Grill Pressure Loss		0.02 "w.c.							
R/A Inlet No.	1R	2R	3R	4R	5R	6R	7R	8R	9R	10R	11R
Inlet Air Volume CFM	180	380	105	140							
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	18	9	57	33							
Equivalent Length	125	130	155	145	50	50	50	50	50	50	50
Total Effective Length	143	139	212	178	50	50	50	50	50	50	50
Adjusted Pressure	0.08	0.08	0.06	0.07	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Duct Size Round	8.0	10.5	6.0	7.5							
Inlet Size	8	8	8	8							
" "	x	x	x	x	x	x	x	x	x	x	x
Inlet Size	14	30	14	14							
Trunk	Z	Z	Z	Z							

Return Trunk Duct Sizing							
Trunk	CFM	Press.	Round	Rect. Size			
Drop	805	0.06	14.5	24x10			
Z	805	0.06	14.5	24x8	18x10		
Y							
X							
W							
V							
U							
T							
S							
R							
Q							

Supply Trunk Duct Sizing							
Trunk	C.CFM	H.CFM	Press.	Round	Rect. Size		
A	390	373	0.08	10.5	12x8	10x10	
B	226	205	0.08	8.5	8x8	107	
C	415	433	0.06	11.5	16x8	12x10	
D	402	332	0.06	11.0	14x8	10x10	
E							
F							
G							
H							
I							
J							
K							





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:** Energy Star  
**Project:** Richmond Hill  
**Model:** Model 2010

## 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)	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	1 @	21.2 cfm	21.2	cfm
Other Bedrooms	2 @	10.6 cfm	21.2	cfm
Bathrooms & Kitchen	5 @	10.6 cfm	53	cfm
Other rooms	5 @	10.6 cfm	53	cfm
Total			148.4	

Principal Ventilation Capacity 9.32.3.4(1)				
Master bedroom	1 @	31.8 cfm	31.8	cfm
Other bedrooms	2 @	15.9 cfm	31.8	cfm
Total			63.6	

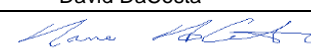
Principal Exhaust Fan Capacity				
Make	Model		Location	
VanEE	V150E75NS		Base	
127 cfm			80.0 Sones	or Equiv.

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	148.4	
Less principal exhaust capacity	63.6	
REQUIRED supplemental vent. Capacity	84.8	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			
HRAI #	5190	BCIN #	32964
Date	September 15, 2023		



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

## Energy Efficiency Design Summary: Performance & Other Acceptable Compliance Methods (Building Code Part 9, Residential)

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Project # PJ-00267  
Layout # JB-09141

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 2010		
Municipality Richmond Hill	Postal code	Reg. Plan number / other description

### 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 = 350.1 m <sup>2</sup> or 3768.9 ft <sup>2</sup>	W, S & G % = 6%	<input type="checkbox"/> Log/Post&Beam <input type="checkbox"/> ICF Above Grade <input type="checkbox"/> ICF Basement
Area of W, S & G = 21.74 m <sup>2</sup> or 234.0 ft <sup>2</sup>		<input type="checkbox"/> Slab-on-ground     Walkout Basement
		<input checked="" type="checkbox"/> Air Conditioning     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 <sup>1</sup>		Building Component	Efficiency Ratings
Thermal Insulation	Nominal	Effective	Windows & Doors Provide U-Value <sup>(1)</sup> 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/(m<sup>2</sup>·K) or Btu/(h·ft<sup>2</sup>·F) but not both.



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

**Energy Efficiency Design Summary:**  
**Performance & Other Acceptable Compliance Methods**  
(Building Code Part 9, Residential)

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Project # PJ-00267  
Layout # JB-09141

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

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	✓		<b>COOLING - ASHP</b>
	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:**  
**Project:**
**Energy Star**  
**Richmond Hill**
**System:**  
**Model:**
**System 1**  
**Model 2010**

## Air Leakage Calculations

Building Air Leakage Heat Loss				
B	LRairh	Vb	HL^T	HLleak
0.018	0.404	21401	77.8	12095

Building Air Leakage Heat Gain				
B	LRairh	Vb	HG^T	HG Leak
0.018	0.112	21401	12.8	553

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	12095	6484	0.9326
Level 2	0.3		4625	0.7846
Level 3	0.2		4193	0.5769
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	
	553		
BUILDING CONDUCTIVE HEAT GAIN		8404	0.0658

Levels this Dwelling	
3	

Highest Ceiling Height		30.0 FT	9.14 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	63.6	77.8	0.20	1069	1.1	63.6	12.8	879	
Case 1						Case 1				
Case 1	Ventilation Heat Loss (Exhaust only Systems)					Ventilation Heat Gain (Exhaust Only Systems)				
	Case 1 - Exhaust Only					Case 1 - Exhaust Only		Multiplier		0.10
	Level	LF	HLbvent	LVL Cond. HL	Multiplier	HGbvent	879			
	Level 1	0.5	1069	6484	0.08	Building	8404			
	Level 2	0.3		4625	0.07					
	Level 3	0.2		4193	0.05					
Level 4	0	0		0.00						
Case 2						Case 2				
Case 2	Ventilation Heat Loss (Direct Ducted Systems)					Ventilation Heat Gain (Direct Ducted Systems)				
				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)				
			HLbvent	Multiplier				Vent Heat Gain	Multiplier	
	Total Ventilation Load		1069	0.07		HGbvent 879		HG*1.3 1	879	0.10

Foundation Conductive Heatloss Level 1	Level 1	1615	Watts	5512	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			Watts		Btu/h

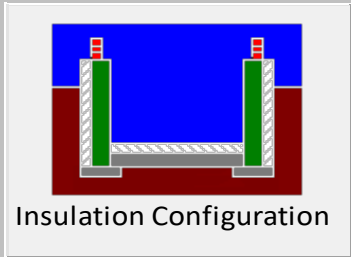
# Envelope Air Leakage Calculator

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):	9.14			
Building Configuration				
Type:	Semi-Detached			
Number of Stories:	Two			
Foundation:	Shallow			
House Volume (m <sup>3</sup> ):	606.08			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (ACH=3.57)			
Custom BDT Data:	ELA @ 10 Pa. ▼ 322.44 cm <sup>2</sup>			
	3.57 ACH @ 50 Pa			
Mechanical Ventilation (L/s):	Total Supply:		Total Exhaust:	
	31.8		31.8	
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Heating Air Leakage Rate (ACH/H):		0.404		
Cooling Air Leakage Rate (ACH/H):		0.112		

# 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):	16.22	 <p>Insulation Configuration</p>
Floor Width (m):	3.44	
Exposed Perimeter (m):	19.51	
Wall Height (m):	2.74	
Depth Below Grade (m):	0.46	
Window Area (m <sup>2</sup> ):	0.74	
Door Area (m <sup>2</sup> ):	3.90	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1615



2985 Drew Road, Suite 202 Mississauga, Ontario L4T 0A4

Tel: 905-671-9800 email: [hvac@gtadesigns.ca](mailto:hvac@gtadesigns.ca)

### 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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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

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

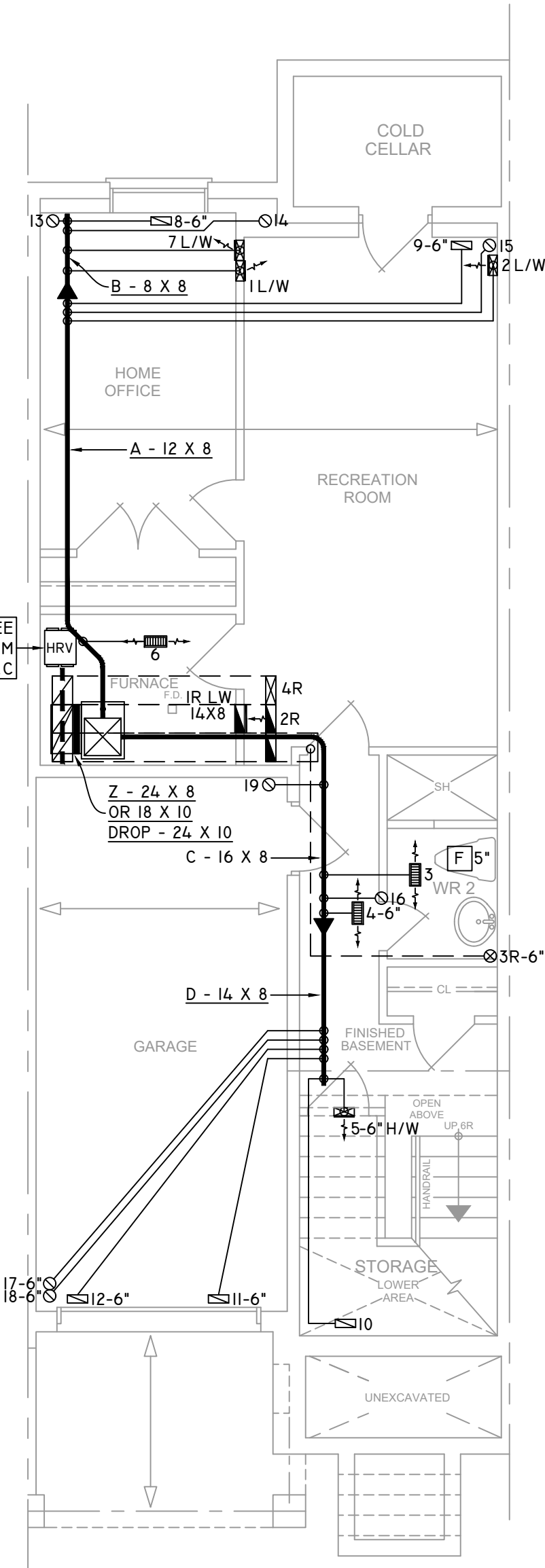
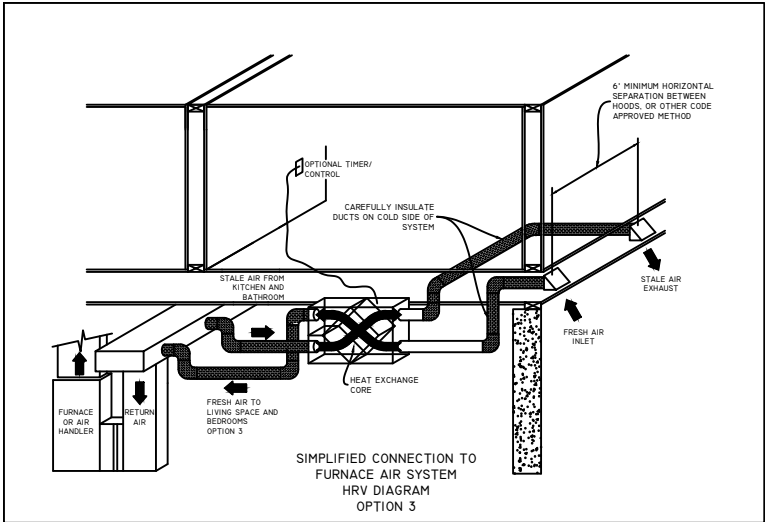
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ENERGY STAR  
SEAL ALL JOINTS ON ANY DUCTWORK.  
SEAL FURNACE VENTS, A/C PIPING AND HRV DUCTS AT EXTERIOR WALLS

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

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

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



BASEMENT FLOOR PLAN '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

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.





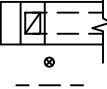








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L4T 0A4 TEL: 905-671-9800  
EMAIL: DAVE@GTADESIGNS.CA  
WEB: WWW.GTADESIGNS.CA

HEAT-LOSS	29,063	BTU/HR.
UNIT MAKE	CARRIER	OR EQUAL.
UNIT MODEL	59SC5B040EI4--10	OR EQUAL.
UNIT HEATING INPUT	40,000	BTU/HR.
UNIT HEATING OUTPUT	39,000	BTU/HR.
A/C COOLING CAPACITY	2.0	TONS.
FAN SPEED	805	CFM

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

FLOOR PLAN: BASEMENT	
DRAWN BY: JL	CHECKED: DD
LAYOUT NO. JB-0914I	DRAWING NO. MI
SQFT 1807	

DATE:	SEPTEMBER 15, 2023
CLIENT:	EM AIR SYSTEMS
MODEL:	MODEL 2010
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 PIPE RISER		RETURN ROUND DUCT		RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)	S.A.	SUPPLY AIR
	RIGID ROUND DUCT		HRV EXHAUST GRILLE								RETURN AIR RISER UP TO FLOOR ABOVE	R.A.	RETURN AIR
	SUPPLY DIFFUSER		SUPPLY AIR PIPE RISER								RETURN AIR FROM BASEMENT SECOND FLOOR	T	THERMOSTAT
			VOLUME DAMPER									\$	PRINCIPAL EXHAUST FAN SWITCH
												F	W/R & PRINCIPAL EXHAUST FAN
												PE	

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

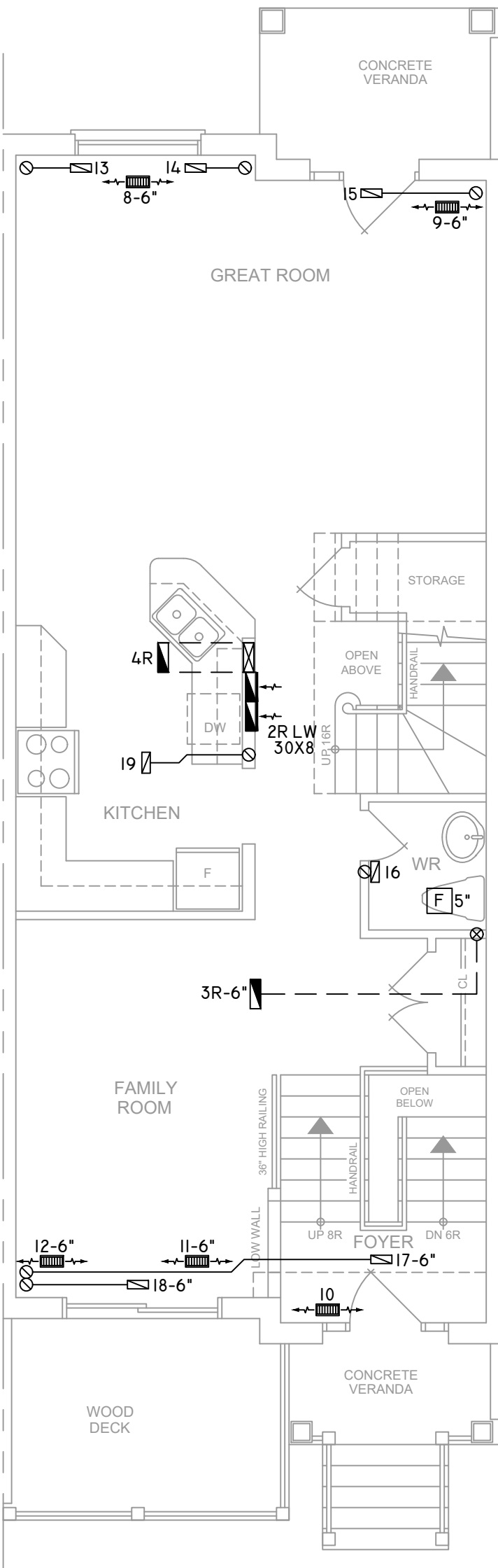
ALL DUCTWORK MUST BE SEALED TO CLASS A LEVEL AS PER OBC PART 6-6.2.4.3. (II)

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

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

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

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



FIRST FLOOR PLAN 'A'

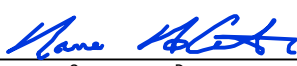
OBC 2012

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**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

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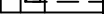












HEAT-LOSS	29,063	BTU/HR.
UNIT MAKE	CARRIER	OR EQUAL.
UNIT MODEL	59SC5B040EI4--10	OR EQUAL.
UNIT HEATING INPUT	40,000	BTU/HR.
UNIT HEATING OUTPUT	39,000	BTU/HR.
A/C COOLING CAPACITY	2.0	TONS.
FAN SPEED	805	CFM

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

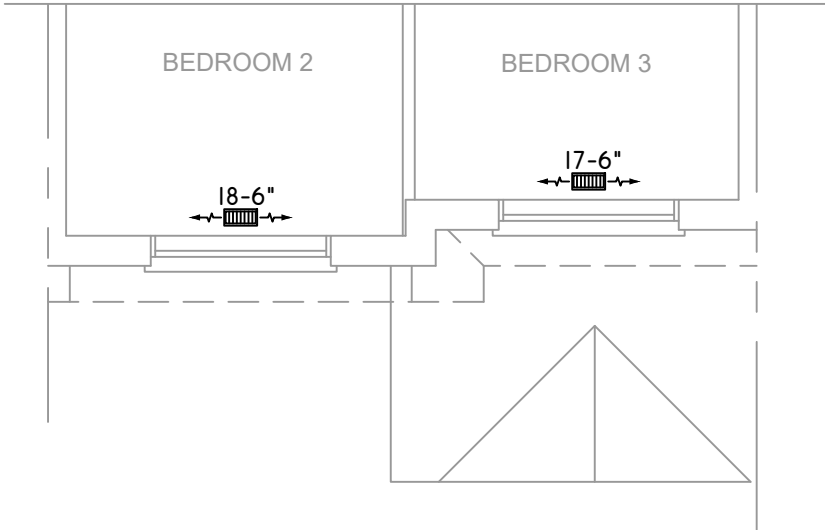
FLOOR PLAN: GROUND FLOOR	
DRAWN BY: JL	CHECKED: DD
LAYOUT NO. JB-0914I	SQFT 1807
	DRAWING NO. M2

DATE:	SEPTEMBER 15, 2023
CLIENT:	EM AIR SYSTEMS
MODEL:	MODEL 2010
PROJECT:	KING EAST DEVELOPMENTS RICHMOND HILL,ONT.
SCALE:	3/16" = 1'-0"

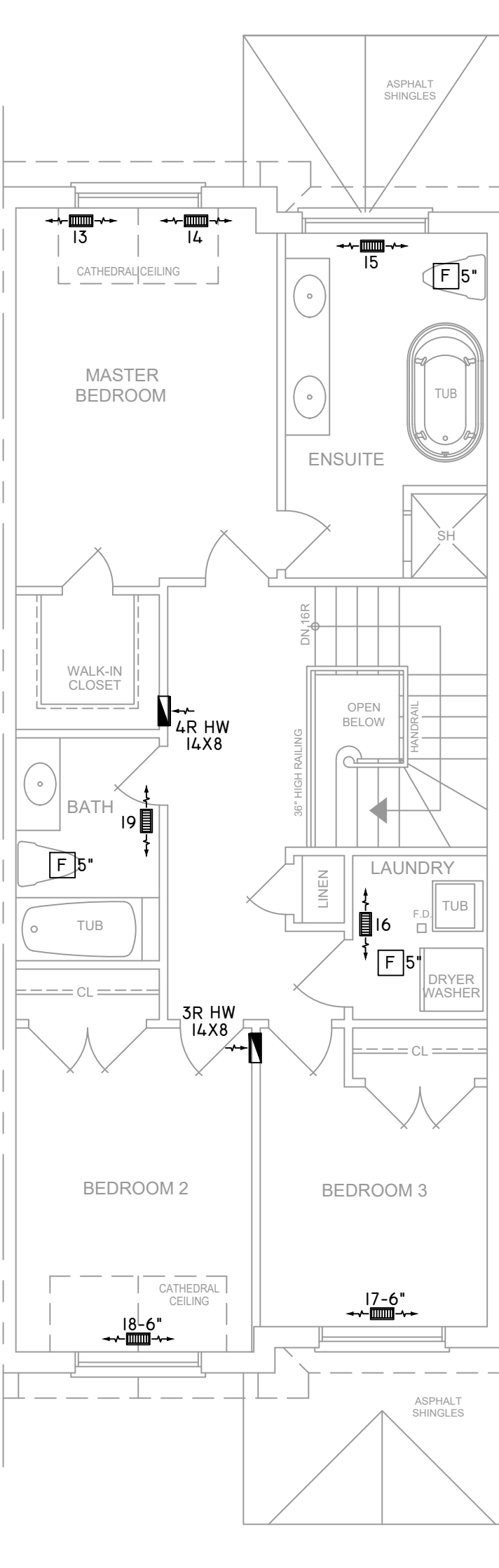


	FLEX DUCT		LOW/HIGH WALL/KICK SUPPLY DIFFUSER		DUCT CONNECTION TO JOIST LINING		RETURN AIR PIPE RISER		RETURN ROUND DUCT		RETURN AIR GRILLE (SIZE INDICATED ON DRAWING)	S.A.	SUPPLY AIR
	RIGID ROUND DUCT		HRV EXHAUST GRILLE		SUPPLY AIR PIPE RISER		RETURN AIR RISER UP TO FLOOR ABOVE		RETURN AIR FROM BASEMENT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

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



SECOND FLOOR PLAN 'B'



SECOND FLOOR PLAN '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**

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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**

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PROVIDE BALANCING DAMPERS ON ALL BRANCHES.

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HEAT-LOSS	29,063	BTU/HR.
UNIT MAKE	CARRIER	OR EQUAL.
UNIT MODEL	59SC5B040E14--10	OR EQUAL.
UNIT HEATING INPUT	40,000	BTU/HR.
UNIT HEATING OUTPUT	39,000	BTU/HR.
A/C COOLING CAPACITY	2.0	TONS.
FAN SPEED	805	CFM

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

FLOOR PLAN: SECOND FLOOR		
DRAWN BY: JL	CHECKED: DD	SQFT 1807
LAYOUT NO. JB-09141	DRAWING NO. M3	

DATE:	SEPTEMBER 15, 2023
CLIENT:	EM AIR SYSTEMS
MODEL:	MODEL 2010
PROJECT:	KING EAST DEVELOPMENTS RICHMOND HILL,ONT.
SCALE:	3/16" = 1'-0"