

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		Unit no.	Lot/con.
Municipality BRAMPTON	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 7003 OPT LAUN Project: VALES OF HUMBER SOUTH	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name)		declare that (choose one as appropriate):	
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
July 10, 2024		 Signature of Designer	
Date			

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 qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by 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 license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: VALES OF HUMBER SOUTH										OPT LAUN				DATE Jul-24		WINTER NATURAL AIR CHANGE RATE 0.241								HEAT LOSS AT °F. 74		CSA-F280-12					
BUILDER: ROYAL PINE HOMES										TYPE: 7003				GFA: 6169		LO# 95350		SUMMER NATURAL AIR CHANGE RATE 0.078								HEAT GAIN ΔT °F. 11		SB-12 PERFORMANCE			
ROOM USE			GREAT			KIT			DIN			LIV			FOY			LIBR			PWD-1			MUD			LAUN-1				
EXP. WALL			52			59			19			40			13			29			9			32			7				
CLG. HT.			11			11			21			11			11			11			11			11			11				
FACTORS																															
GRS.WALL AREA			572			649			399			440			143			319			99			352			77				
GLAZING			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN				
NORTH			20.8	15.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
EAST			20.8	41.0	0	0	0	0	0	0	0	44	914	1806	28	582	1149	44	914	1806	0	0	0	0	0	0	0	0	0	0	
SOUTH			20.8	24.4	0	0	0	0	0	0	86	1787	2098	8	166	195	0	0	0	0	0	0	0	0	0	0	0	0	0		
WEST			20.8	41.0	102	2119	4187	100	2078	4105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SKYLT.			34.1	100.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
DOORS			24.7	3.7	0	0	0	0	0	0	0	0	0	0	25	616	91	0	0	0	0	0	0	20	493	73	0	0	0		
NET EXPOSED WALL			3.5	0.5	470	1630	242	549	1904	282	313	1085	161	388	1345	199	90	312	46	275	954	141	99	343	51	332	1151	171	77	267	40
NET EXPOSED BSMT WALL ABOVE GR			3.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EXPOSED CLG			1.3	0.6	0	0	0	0	0	0	285	357	159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
NO ATTIC EXPOSED CLG			2.7	1.2	10	27	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EXPOSED FLOOR			2.5	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS					0		0		0		0		0		0		0		0		0		0		0		0		0		
SLAB ON GRADE HEAT LOSS					0		0		0		0		0		0		0		0		0		0		0		0		0		
SUBTOTAL HT LOSS					3776		3981		3229		2426		1510		1868		343		1644		267										
SUB TOTAL HT GAIN					4440		4387		2418		2201		1287		1947		51		244		40										
LEVEL FACTOR / MULTIPLIER			0.30	0.48			0.30	0.48		0.30	0.48		0.30	0.48		0.30	0.48		0.30	0.48		0.30	0.48		0.30	0.48					
AIR CHANGE HEAT LOSS					1809		1908		1547		1162		724		895		164		788		128										
AIR CHANGE HEAT GAIN					220		217		120		109		64		96		3		12		2										
DUCT LOSS					0		0		0		0		0		0		0		0		0										
DUCT GAIN					0		0		0		0		0		0		0		0		0										
HEAT GAIN PEOPLE			240		0		0		0		0		0		0		0		0		0										
HEAT GAIN APPLIANCES/LIGHTS					975		975		975		975		975		975		0		975		0										
TOTAL HT LOSS BTU/H					5585		5889		4776		3588		2234		2763		508		2432		395										
TOTAL HT GAIN x 1.3 BTU/H					7327		7254		4567		4271		1756		3925		69		333		1322										

ROOM USE																					BAS	
EXP. WALL																					242	
CLG. HT.																					10	
FACTORS																						
GRS.WALL AREA	LOSS	GAIN																			1694	
GLAZING																					LOSS GAIN	
NORTH	20.8	15.5																			0 0 0	
EAST	20.8	41.0																			0 0 0	
SOUTH	20.8	24.4																			12 249 293	
WEST	20.8	41.0																			12 249 493	
SKYLT.	34.1	100.3																			0 0 0	
DOORS	24.7	3.7																			20 493 73	
NET EXPOSED WALL	3.5	0.5																			0 0 0	
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5																			726 2551 378	
EXPOSED CLG	1.3	0.6																			0 0 0	
NO ATTIC EXPOSED CLG	2.7	1.2																			0 0 0	
EXPOSED FLOOR	2.5	0.4																			0 0 0	
BASEMENT/CRAWL HEAT LOSS																					8717	
SLAB ON GRADE HEAT LOSS																						
SUBTOTAL HT LOSS																					12259	
SUB TOTAL HT GAIN																					1237	
LEVEL FACTOR / MULTIPLIER																					0.50 1.24	
AIR CHANGE HEAT LOSS																					15208	
AIR CHANGE HEAT GAIN																					61	
DUCT LOSS																					0	
DUCT GAIN																					0	
HEAT GAIN PEOPLE	240																				0	
HEAT GAIN APPLIANCES/LIGHTS																					0	
TOTAL HT LOSS BTU/H																					27468	
TOTAL HT GAIN x 1.3 BTU/H																					1687	

TOTAL HEAT GAIN BTU/H: 72513 TONS: 6.04 LOSS DUE TO VENTILATION LOAD BTU/H: 6010 STRUCTURAL HEAT LOSS: 88797 TOTAL COMBINED HEAT LOSS BTU/H: 94808

SITE NAME: VALES OF HUMBER SOUTH										OPT LAUN					DATE Jul-24					WINTER NATURAL AIR CHANGE RATE 0.241										HEAT LOSS AT °F. 74					CSA-F280-12									
BUILDER: ROYAL PINE HOMES										TYPE: 7003					GFA: 6169					LO# 95350					SUMMER NATURAL AIR CHANGE RATE 0.078										HEAT GAIN ΔT °F. 11					SB-12 PERFORMANCE				
ROOM USE			PR/ST			ENS			WIC-1			WIC-2			BED-2			BED-3			BED-4			BED-5			ENS-2			ENS-3														
EXP. WALL			59			34			8			0			14			24			14			51			12			0														
CLG. HT.			11			10			10			10			10			10			10			11			10			10														
FACTORS																																												
GRS.WALL AREA			LOSS GAIN			649			340			80			0			140			240			140			561			120			0											
GLAZING			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN											
NORTH			20.8	15.5	0	0	0	28	582	433	0	0	0	0	0	0	24	499	371	24	499	371	0	0	0	0	0	0	0	0	0	0	0	0										
EAST			20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	665	1314	40	831	1642	78	1621	3202	0	0	0	0	0	0	0										
SOUTH			20.8	24.4	8	166	195	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
WEST			20.8	41.0	92	1911	3776	40	831	1642	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	332	657	0	0	0	0	0	0									
SKYLT.			34.1	100.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
DOORS			24.7	3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	370	55	0	0	0	0	0	0	0	0	0	0								
NET EXPOSED WALL			3.5	0.5	549	1904	282	272	943	140	80	277	41	0	0	0	116	402	60	184	638	95	100	347	51	468	1623	241	104	361	53	0	0	0	0									
NET EXPOSED BSMT WALL ABOVE GR			3.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
EXPOSED CLG			1.3	0.6	1199	1502	668	288	361	160	88	110	49	106	133	59	350	439	195	350	439	195	346	434	193	420	526	234	78	98	43	90	113	50	0	0								
NO ATTIC EXPOSED CLG			2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98	263	117	0	0	0	0	0	0	0	0	0								
EXPOSED FLOOR			2.5	0.4	0	0	0	0	0	0	0	0	0	0	0	0	150	373	55	250	622	92	100	249	37	200	498	74	60	149	22	0	0	0	0	0								
BASEMENT/CRAWL HEAT LOSS						0			0			0			0			0			0			0			0			0			0			0			0					
SLAB ON GRADE HEAT LOSS						0			0			0			0			0			0			0			0			0			0			0			0					
SUBTOTAL HT LOSS						5483			2717			388			133			1713			2862			1860			4900			940			113											
SUB TOTAL HT GAIN						4922			2375			90			59			681			2067			1923			3922			776			50											
LEVEL FACTOR / MULTIPLIER			0.20	0.24				0.20	0.24				0.20	0.24				0.20	0.24				0.20	0.24				0.20	0.24				0.20	0.24										
AIR CHANGE HEAT LOSS						1328			658			94			32			415			693			450			1186			228			27											
AIR CHANGE HEAT GAIN						244			118			4			3			34			102			95			194			38			2											
DUCT LOSS						0			0			0			0			213			356			231			609			117			0											
DUCT GAIN						0			0			0			0			193			338			323			533			81			0											
HEAT GAIN PEOPLE			240		2	480	0	0	0	0	0	0	0	1	240	1	240	1	240	1	240	1	240	1	240	1	240	0	0	0	0	0	0	0	0	0								
HEAT GAIN APPLIANCES/LIGHTS						975			0			0			0			975			975			975			975			975			0			0			0					
TOTAL HT LOSS BTU/H						6811			3374			481			165			2340			3911			2542			6695			1285			140											
TOTAL HT GAIN x 1.3 BTU/H						8608			3241			123			81			2761			4840			4624			7624			1164			68											

ROOM USE			ENS-4			ENS-5			WIC-3			LAUN-2											
EXP. WALL			20			7			19			0											
CLG. HT.			11			10			10			10											
FACTORS																							
GRS.WALL AREA	LOSS	GAIN	220			70			190			0											
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN										
NORTH	20.8	15.5	0	0	0	0	0	0	0	0	0	0	0	0									
EAST	20.8	41.0	51	1060	2093	0	0	0	16	332	657	0	0	0									
SOUTH	20.8	24.4	0	0	0	8	166	195	0	0	0	0	0	0									
WEST	20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0									
SKYLT.	34.1	100.3	0	0	0	0	0	0	0	0	0	0	0	0									
DOORS	24.7	3.7	0	0	0	0	0	0	0	0	0	0	0	0									
NET EXPOSED WALL	3.5	0.5	169	586	87	62	215	32	174	603	89	0	0	0									
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	0	0	0	0	0	0	0	0	0	0	0	0									
EXPOSED CLG	1.3	0.6	106	133	59	105	132	59	90	113	50	70	88	39									
NO ATTIC EXPOSED CLG	2.7	1.2	20	54	24	0	0	0	0	0	0	0	0	0									
EXPOSED FLOOR	2.5	0.4	126	314	47	0	0	0	90	224	33	0	0	0									
BASEMENT/CRAWL HEAT LOSS					0			0			0			0									
SLAB ON GRADE HEAT LOSS					0			0			0			0									
SUBTOTAL HT LOSS					2146			513			1273			88									
SUB TOTAL HT GAIN					2310			286			830			39									
LEVEL FACTOR / MULTIPLIER			0.20	0.24		0.20	0.24		0.20	0.24		0.20	0.24										
AIR CHANGE HEAT LOSS					519			124			308			21									
AIR CHANGE HEAT GAIN						114		14			41			2									
DUCT LOSS					267			0			158			0									
DUCT GAIN						242		0			87			0									
HEAT GAIN PEOPLE	240		0			0		0	0		0			0									
HEAT GAIN APPLIANCES/LIGHTS					0			0			0												
TOTAL HT LOSS BTU/H					2932			637			1739			109									
TOTAL HT GAIN x 1.3 BTU/H					3467			390			1245			1321									

SITE NAME: VALES OF HUMBER SOUTH
BUILDER: ROYAL PINE HOMES

TYPE: 7003
OPT LAUN

DATE: Jul-24

GFA: 6169 LO# 95350

FURNACE 1

HEATING CFM 1105 COOLING CFM 1105
TOTAL HEAT LOSS 55,636 TOTAL HEAT GAIN 32,510
AIR FLOW RATE CFM 19.86 AIR FLOW RATE CFM 33.99

FACTORY furnace pressure 0.6
INSTALLED furnace filter 0.00
a/c coil pressure 0.25
available pressure
for s/a & r/a 0.35

FURNACE HEAT LOSS +
HRV / ERV HEAT LOSS
= 58642 BTUH
CARRIER
59SC6A080M17--16
80

AFUE = 97 %

INPUT (BTU/H) = 80,000

OUTPUT (BTU/H) = **78,000**

DESIGN CFM = **1105**

CFM @ .6" E.S.P.

TEMPERATURE RISE 65 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	0	20	9
R/A	0	0	0	5	1

All S/A diffusers 4"x10" unless noted otherwise on layout.

All S/A runs 5"Ø unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	GREAT	GREAT	GREAT	GREAT	KIT	KIT	KIT	KIT	DIN	DIN	DIN	LIV	LIV	LIV	FOY	LIBR	LIBR	PWD-1	MUD	LAUN-1	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.40	1.40	1.40	1.40	1.47	1.47	1.47	1.47	1.59	1.59	1.59	1.20	1.20	1.20	2.23	1.38	1.38	0.51	2.43	0.39	3.05	3.05	3.05	3.05
CFM PER RUN HEAT	28	28	28	28	29	29	29	29	32	32	32	24	24	24	44	27	27	10	48	8	61	61	61	61
RM GAIN MBH.	1.83	1.83	1.83	1.83	1.81	1.81	1.81	1.81	1.52	1.52	1.52	1.42	1.42	1.42	1.76	1.96	1.96	0.07	0.33	1.32	0.19	0.19	0.19	0.19
CFM PER RUN COOLING	62	62	62	62	62	62	62	62	52	52	52	48	48	48	60	67	67	2	11	45	6	6	6	6
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	47	40	36	30	24	24	24	36	37	33	39	60	57	54	53	68	72	58	48	42	31	18	33	43
EQUIVALENT LENGTH	100	130	90	120	130	120	130	120	170	130	110	140	130	130	170	190	190	120	140	130	100	130	110	120
TOTAL EFFECTIVE LENGTH	147	170	126	150	154	144	154	156	207	163	149	200	187	184	223	258	262	178	188	172	131	148	143	163
ADJUSTED PRESSURE	0.12	0.1	0.14	0.11	0.11	0.12	0.11	0.11	0.08	0.11	0.12	0.09	0.09	0.09	0.08	0.07	0.07	0.1	0.09	0.1	0.13	0.12	0.12	0.11
ROUND DUCT SIZE	5	5	4	5	5	5	5	5	4	4	5	5	5	5	5	6	6	4	4	4	4	5	5	5
HEATING VELOCITY (ft/min)	206	206	321	206	213	213	213	213	235	367	367	176	176	176	323	138	138	115	551	92	700	448	448	448
COOLING VELOCITY (ft/min)	455	455	711	455	455	455	455	455	382	597	597	352	352	352	441	342	342	23	126	516	69	44	44	44
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	A	B	B	B	C	C	C	F	F	F	E	E	E	E	E	E	F	A	A	C	C	B	A

RUN #	25	26	27	28	29
ROOM NAME	BAS	BAS	BAS	BAS	BAS
RM LOSS MBH.	3.05	3.05	3.05	3.05	3.05
CFM PER RUN HEAT	61	61	61	61	61
RM GAIN MBH.	0.19	0.19	0.19	0.19	0.19
CFM PER RUN COOLING	6	6	6	6	6
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	33	38	42	53	65
EQUIVALENT LENGTH	180	130	100	150	180
TOTAL EFFECTIVE LENGTH	213	168	142	203	245
ADJUSTED PRESSURE	0.08	0.1	0.12	0.08	0.07
ROUND DUCT SIZE	5	5	5	5	5
HEATING VELOCITY (ft/min)	448	448	448	448	448
COOLING VELOCITY (ft/min)	44	44	44	44	44
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10
TRUNK	F	F	B	E	E

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE									
TRUNK	STATIC	ROUND	RECT	VELOCITY		TRUNK	STATIC	ROUND	RECT	VELOCITY		TRUNK	STATIC	ROUND	RECT	VELOCITY		TRUNK	STATIC
CFM	PRESS.	DUCT	DUCT	(ft/min)		CFM	PRESS.	DUCT	DUCT	(ft/min)		CFM	PRESS.	DUCT	DUCT	(ft/min)		CFM	PRESS.
TRUNK A	173	0.09	7.1	8	x	8	389	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0
TRUNK B	380	0.09	9.5	12	x	8	570	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0
TRUNK C	209	0.11	7.2	8	x	8	470	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0
TRUNK D	589	0.09	11.2	14	x	8	757	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0
TRUNK E	292	0.07	9.1	12	x	8	438	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	0
TRUNK F	520	0.07	11.3	16	x	8	585	TRUNK L	0	0.00	0	0	x	8	0	TRUNK T	0	0.05	0

RETURN AIR #	1	2	3	4	5	BR									
AIR VOLUME	150	310	130	130	120	0	0	0	0	0	0	0	0	0	265
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	44	30	20	58	71	1	1	1	1	1	1	1	1	1	18
EQUIVALENT LENGTH	160	145	145	195	200	0	0	0	0	0	0	0	0	0	150
TOTAL EFFECTIVE LH	204	175	165	253	271	1	1	1	1	1	1	1	1	1	168
ADJUSTED PRESSURE	0.07	0.08	0.09	0.06	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7.1	9	6.3	7	7.1	0	0	0	0	0	0	0	0	0	8.3
INLET GRILL SIZE	8	8	8	8	8	0	0	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	30	14	14	14	0	0	0	0	0	0	0	0	0	24

SITE NAME: VALES OF HUMBER SOUTH
BUILDER: ROYAL PINE HOMES

OPT LAUN
TYPE: 7003

DATE: Jul-24

GFA: 6169 LO# 95350

FURNACE 2

HEATING CFM 1300 COOLING CFM 1300
TOTAL HEAT LOSS 33,161 TOTAL HEAT GAIN 39,557
AIR FLOW RATE CFM 39.2 AIR FLOW RATE CFM 32.86

FACTORY furnace pressure 0.6
INSTALLED furnace filter 0.00
a/c coil pressure 0.29
available pressure
for s/a & r/a 0.31

FURNACE HEAT LOSS +
HRV / ERV HEAT LOSS
= 36166 BTUH
CARRIER
59SC6A060M17--16
FAN SPEED 60
LOW 0
MEDLOW 790
MEDIUM 975
MEDIUM HIGH 1140
HIGH 1300

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

DESIGN CFM = **1300**
CFM @ .6" E.S.P.

TEMPERATURE RISE 41 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	28	0	0
R/A	0	0	7	0	0

All S/A diffusers 4"x10" unless noted otherwise on layout.

All S/A runs 5"Ø unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	PR/ST	PR/ST	PR/ST	PR/ST	ENS	ENS	ENS	WIC-1	WIC-2	BED-2	BED-2	ENS-2	BED-3	BED-3	BED-3	ENS-3	WIC-3	BED-4	BED-4	BED-4	ENS-4	ENS-4	BED-5	BED-5
RM LOSS MBH.	1.70	1.70	1.70	1.70	1.12	1.12	1.12	0.48	0.16	1.17	1.17	1.28	1.30	1.30	1.30	0.14	1.74	0.85	0.85	0.85	1.47	1.47	1.67	1.67
CFM PER RUN HEAT	67	67	67	67	44	44	44	19	6	46	46	50	51	51	51	5	68	33	33	33	57	57	66	66
RM GAIN MBH.	2.15	2.15	2.15	2.15	1.08	1.08	1.08	0.12	0.08	1.38	1.38	1.16	1.61	1.61	1.61	0.07	1.25	1.54	1.54	1.54	1.73	1.73	1.91	1.91
CFM PER RUN COOLING	71	71	71	71	35	35	35	4	3	45	45	38	53	53	53	2	41	51	51	51	57	57	63	63
ADJUSTED PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	68	73	45	41	47	52	47	37	30	53	61	43	96	96	98	76	100	84	88	92	86	96	79	75
EQUIVALENT LENGTH	200	200	190	190	110	160	140	130	120	150	160	160	150	140	180	160	160	200	210	220	140	150	160	160
TOTAL EFFECTIVE LENGTH	268	273	235	231	157	212	187	167	150	203	221	203	246	236	278	236	260	284	298	312	226	246	239	235
ADJUSTED PRESSURE	0.06	0.06	0.06	0.07	0.1	0.07	0.08	0.09	0.1	0.07	0.07	0.07	0.06	0.06	0.05	0.06	0.06	0.05	0.05	0.05	0.07	0.06	0.06	0.06
ROUND DUCT SIZE	6	6	6	5	5	5	5	4	4	6	6	5	6	6	6	4	6	5	5	5	5	5	6	6
HEATING VELOCITY (ft/min)	342	342	342	492	323	323	323	218	69	235	235	367	260	260	260	57	347	242	242	242	419	419	337	337
COOLING VELOCITY (ft/min)	362	362	362	521	257	257	257	46	34	229	229	279	270	270	270	23	209	374	374	374	419	419	321	321
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10
TRUNK	C	C	E	E	E	D	D	E	E	D	D	D	C	C	B	C	B	A	A	A	B	B	A	A

RUN #	25	26	27	28
ROOM NAME	BED-5	BED-5	ENS-5	LAUN-2
RM LOSS MBH.	1.67	1.67	0.64	0.11
CFM PER RUN HEAT	66	66	25	4
RM GAIN MBH.	1.91	1.91	0.39	1.32
CFM PER RUN COOLING	63	63	13	43
ADJUSTED PRESSURE	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	69	73	60	44
EQUIVALENT LENGTH	180	180	160	170
TOTAL EFFECTIVE LENGTH	249	253	220	214
ADJUSTED PRESSURE	0.06	0.06	0.07	0.07
ROUND DUCT SIZE	6	6	4	5
HEATING VELOCITY (ft/min)	337	337	287	29
COOLING VELOCITY (ft/min)	321	321	149	316
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10
TRUNK	A	A	C	D

SUPPLY AIR TRUNK SIZE											RETURN AIR TRUNK SIZE															
	TRUNK	STATIC	ROUND	RECT				VELOCITY		TRUNK	STATIC	ROUND	RECT				VELOCITY		TRUNK	STATIC	ROUND	RECT				VELOCITY
	CFM	PRESS.	DUCT	DUCT				(ft/min)		CFM	PRESS.	DUCT	DUCT				(ft/min)		CFM	PRESS.	DUCT	DUCT				(ft/min)
TRUNK A	363	0.05	10.8	14	x	8	467		TRUNK G	0	0.00	0	0	x	8	0		TRUNK O	0	0.05	0	0	x	8	0	
TRUNK B	596	0.05	13	20	x	8	536		TRUNK H	0	0.00	0	0	x	8	0		TRUNK P	0	0.05	0	0	x	8	0	
TRUNK C	862	0.05	14.9	26	x	8	597		TRUNK I	0	0.00	0	0	x	8	0		TRUNK Q	0	0.05	0	0	x	8	0	
TRUNK D	234	0.07	8.4	8	x	8	527		TRUNK J	0	0.00	0	0	x	8	0		TRUNK R	0	0.05	0	0	x	8	0	
TRUNK E	437	0.06	11.1	14	x	8	562		TRUNK K	0	0.00	0	0	x	8	0		TRUNK S	0	0.05	0	0	x	8	0	
TRUNK F	0	0.00	0	0	x	8	0		TRUNK L	0	0.00	0	0	x	8	0		TRUNK T	0	0.05	0	0	x	8	0	

RETURN AIR #	1	2	3	4	5	6	7											BR							
AIR VOLUME	240	115	210	115	210	210	200	0	0	0	0	0	0	0	0	0	0	TRUNK W	315	0.05	10.2	12	x	8	473
PLENUM 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	TRUNK X	985	0.05	15.7	28	x	8	633
ACTUAL DUCT LGH.	45	69	103	103	105	91	53	1	1	1	1	1	1	1	1	1	1	TRUNK Y	745	0.05	14.1	24	x	8	559
EQUIVALENT LENGTH	165	190	180	175	180	185	185	0	0	0	0	0	0	0	0	0	0	TRUNK Z	325	0.05	10.4	12	x	8	488
TOTAL EFFECTIVE LH	210	259	283	278	285	276	238	1	1	1	1	1	1	1	1	1	1	DROP	1300	0.05	17.4	24	x	14	557
ADJUSTED PRESSURE	0.06	0.05	0.05	0.05	0.05	0.05	0.05	12.88	12.88	12.88	12.88	12.88	12.88	12.88	12.88	12.88	12.88								
ROUND DUCT SIZE	8.8	7	8.8	7	8.8	8.8	8.6	0	0	0	0	0	0	0	0	0	0								
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0								
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
INLET GRILL SIZE	30	14	30	14	30	30	30	0	0	0	0	0	0	0	0	0	0								

TYPE: 7003
SITE NAME: VALES OF HUMBER SOUTH

LO # 95350
OPT LAUN

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Kitchen & Bathrooms	<u>8</u> @ 10.6 cfm	<u>84.8</u> cfm
Other Rooms	<u>7</u> @ 10.6 cfm	<u>74.2</u> cfm
Table 9.32.3.A.	TOTAL	<u>243.8</u> cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		<u>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>243.8</u>	cfm
Less Principal Ventil. Capacity	<u>150</u>	cfm
Required Supplemental Capacity	<u>93.8</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE V150H
Location:	BSMT
<u>150.0</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
150.0 CFM	X 74 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-3	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model:	VANEE V150H	INSTALL 2 HRV / ERV's
<u>150</u>	cfm high	<u>35</u> cfm low
<u>75</u>	% Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved

LOCATION OF INSTALLATION	
Lot:	Concession
Township	Plan:
Address	
Roll #	Building Permit #

BUILDER:	
ROYAL PINE HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	Fax #:

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	July-24

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

Michael O'Rourke

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 95350	Model: 7003	Builder: ROYAL PINE HOMES	Date: 7/10/2024																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>2783</td> <td>10</td> <td>27830</td> </tr> <tr> <td>First</td> <td>2783</td> <td>11</td> <td>30613</td> </tr> <tr> <td>Second</td> <td>3651</td> <td>10</td> <td>36510</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>94,953.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>2688.8 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	2783	10	27830	First	2783	11	30613	Second	3651	10	36510	Third	0	9	0	Fourth	0	9	0	Total:			94,953.0 ft³	Total:			2688.8 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.241</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.078</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-19</td> <td style="text-align: center;">41</td> <td style="text-align: center;">74</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">30</td> <td style="text-align: center;">6</td> <td style="text-align: center;">11</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.241	SUMMER NATURAL AIR CHANGE RATE	0.078	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-19	41	74	Summer DTDc	24	30	6	11
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.241 x 746.88 x 41 °C x 1.2 = 8915 W = 30417 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.078 x 746.88 x 6 °C x 1.2 = 430 W = 1466 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E) \times 2 \text{ HRV / ERV's}$ 300 CFM x 74 °F x 1.08 x 0.25 = 6010 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 300 CFM x 11 °F x 1.08 x 0.25 = 891 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level \ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	30,417	12,259	1.241																																																								
2	0.3		19,044	0.479																																																								
3	0.2		25,128	0.242																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												
				Michael O'Rourke BCIN# 19669 																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 7003	OPT LAUN	BUILDER: ROYAL PINE HOMES
SFQT: 6169	LO# 95350	SITE: VALES OF HUMBER SOUTH

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75
		WINDOW SHGC	0.60

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	94953.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 64.0 ft	WIDTH: 57.0 ft	EXPOSED PERIMETER:	242.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
SB-12 PERFORMANCE****Nominal Min. Eff.**

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	21.40
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.9	-

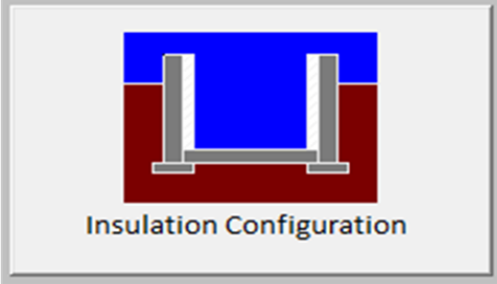
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	19.5	 Insulation Configuration
Floor Width (m):	17.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	2.2	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		2554

TYPE: 7003
LO# 95350

OPT LAUN

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Brampton			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	7.32			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	2688.8			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2510.0 cm ²		
	2.50	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	70.8	70.8		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.241			
Cooling Air Leakage Rate (ACH/H):	0.078			

TYPE: 7003
LO# 95350

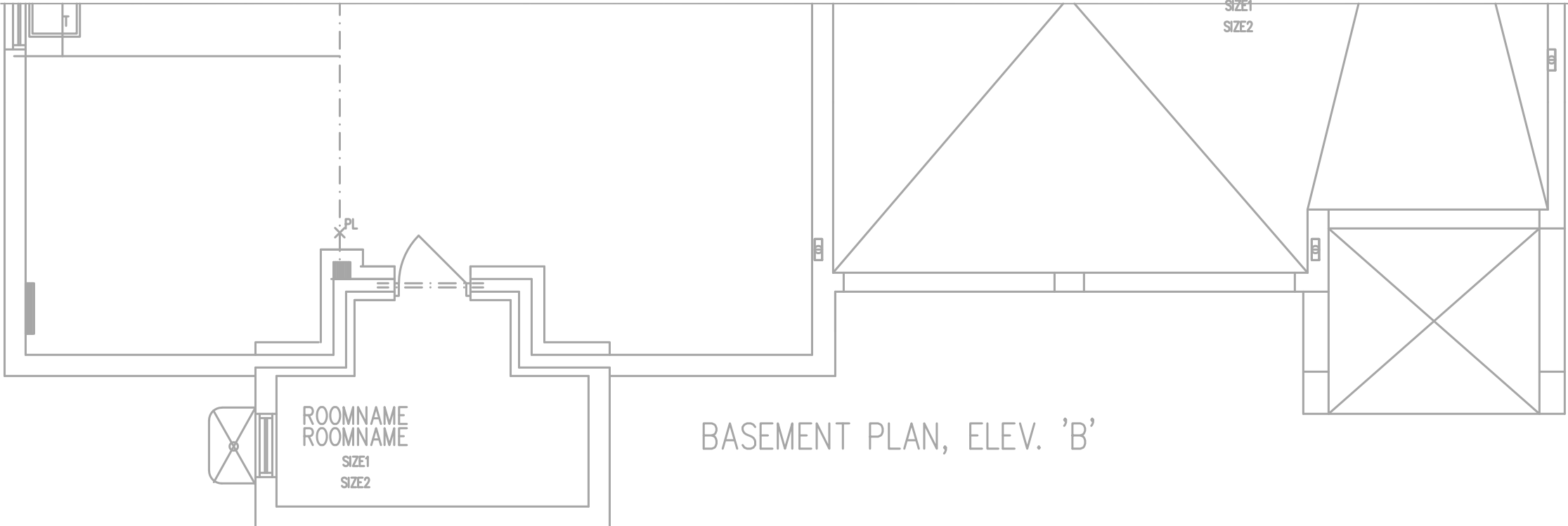
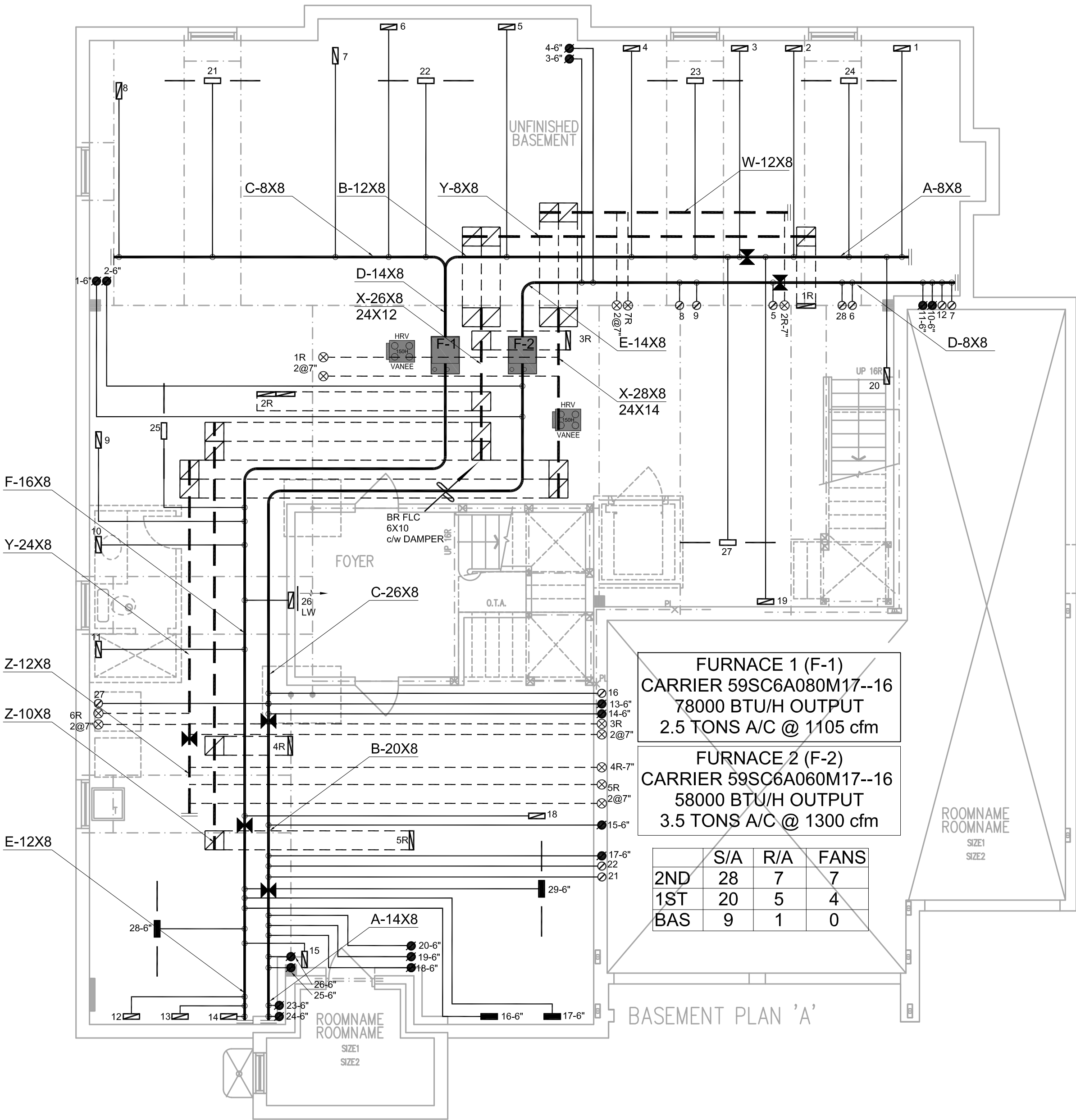
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	LINEAR BAR or LINEAR SLOT GRILLE
	SUPPLY AIR BOOT ABOVE
	6" SUPPLY AIR BOOT ABOVE
	SUPPLY AIR STACK
	6" SUPPLY AIR STACK
	14X8 RETURN AIR GRILLE
	30X8 RETURN AIR GRILLE
	FLOOR RETURN AIR GRILLE
	RETURN STACK ABOVE
	RETURN AIR STACK
	REDUCER
	SUPPLY DUCTWORK
	RETURN DUCTWORK
	FLEX DUCT
	EXHAUST FAN
	LINT TRAP by REVERSOMATIC
	DIRECT VENT
	LOW WALL
	HIGH WALL
	CEILING
	MOTORIZED ZONE DAMPER
	MOTORIZED DAMPER
	EXHAUST PIPE
	CONCENTRIC VENT KIT
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3	REVISED AS PER CAD	JULY/2024	HR
2	REVISED TO PERFORMANCE PATH	APR/2022	KB
1	ISSUED FOR PERMIT	MAR/2022	EG
No.	Revision	Date	By

SB-12 PACKAGE PERFORMANCE

I Michael O'Rourke have reviewed and take responsibility for the design work and am qualified under division C.3.2.5 of the building code.

Michael O'Rourke BCIN# 19689 HVAC Designs Ltd.

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Specializing in Residential Mechanical Design Services

Client ROYAL PINE HOMES

Project Name VALES OF HUMBER SOUTH
BRAMPTON, ONTARIO
7003 - OPT LAUN
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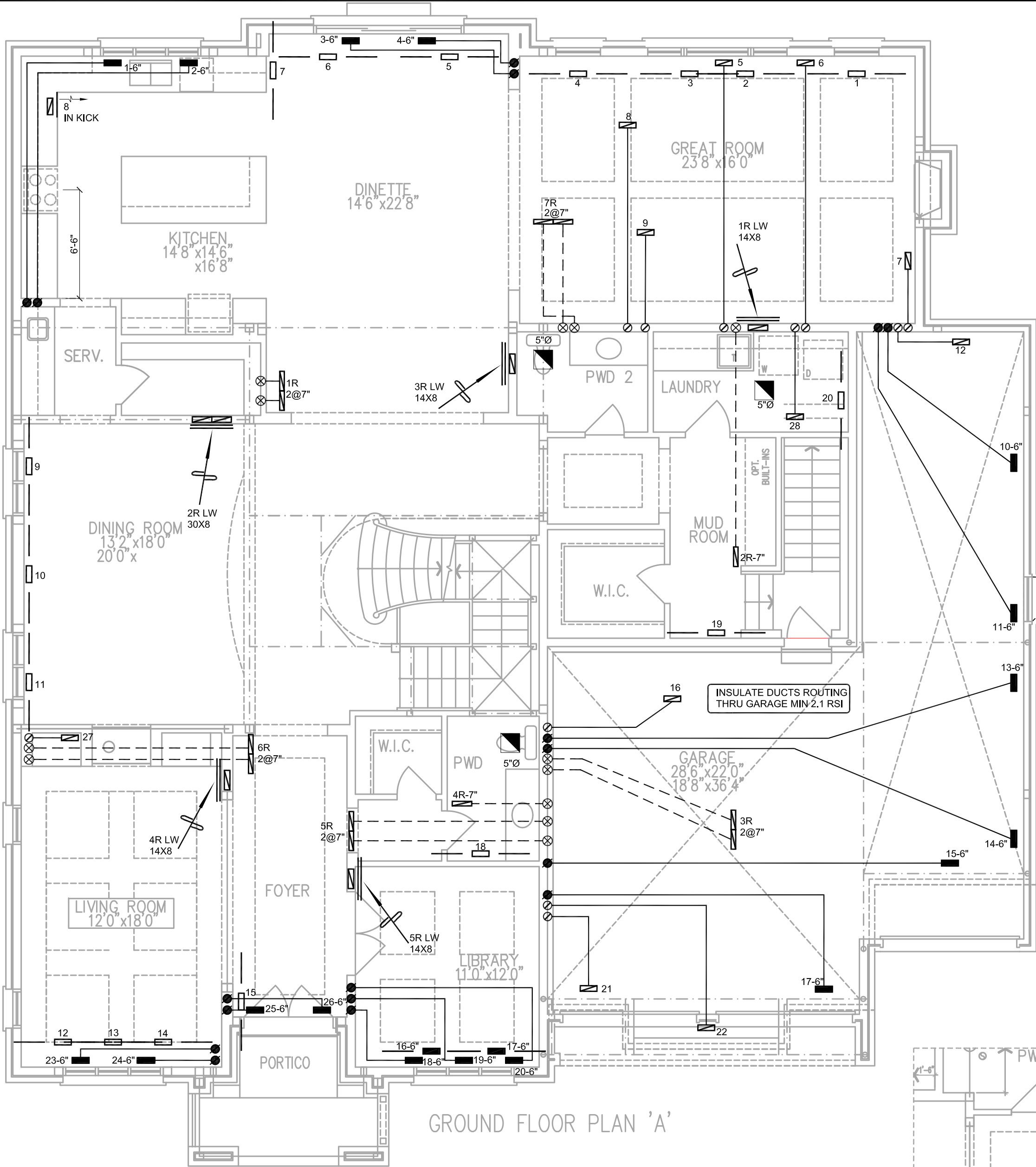
Sheet Title	BASEMENT	HEATING LAYOUT
Drawn By	HR	Checked By MO
Scale	3/16"=1'-0"	Sheet No.
Date	MARCH 2022	1
LO #	95350	3

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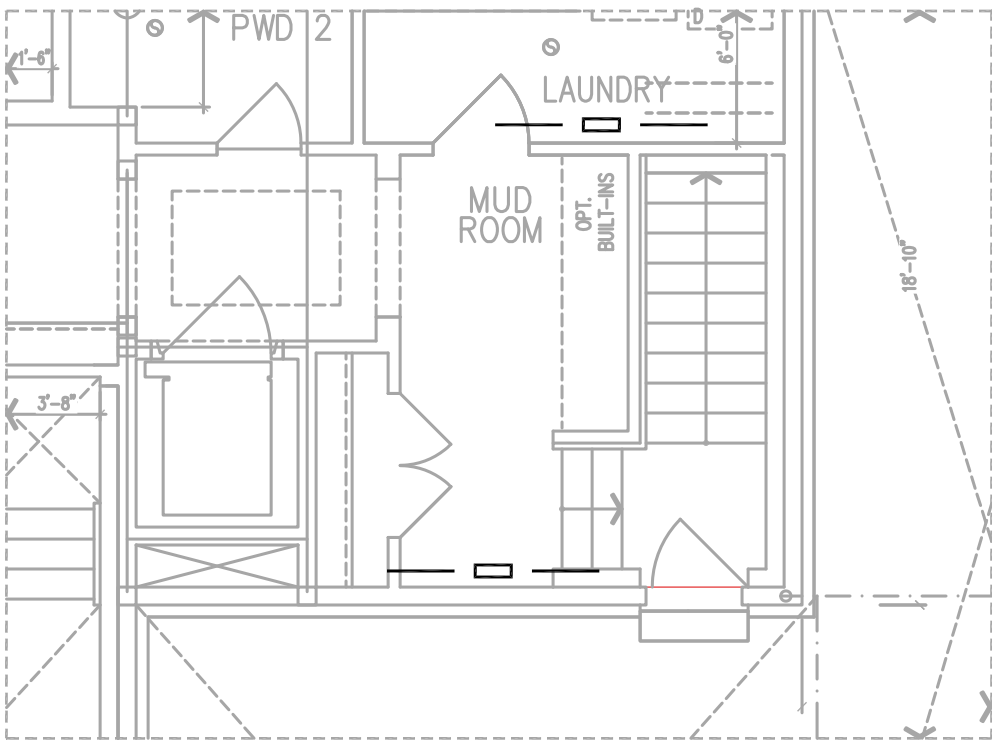
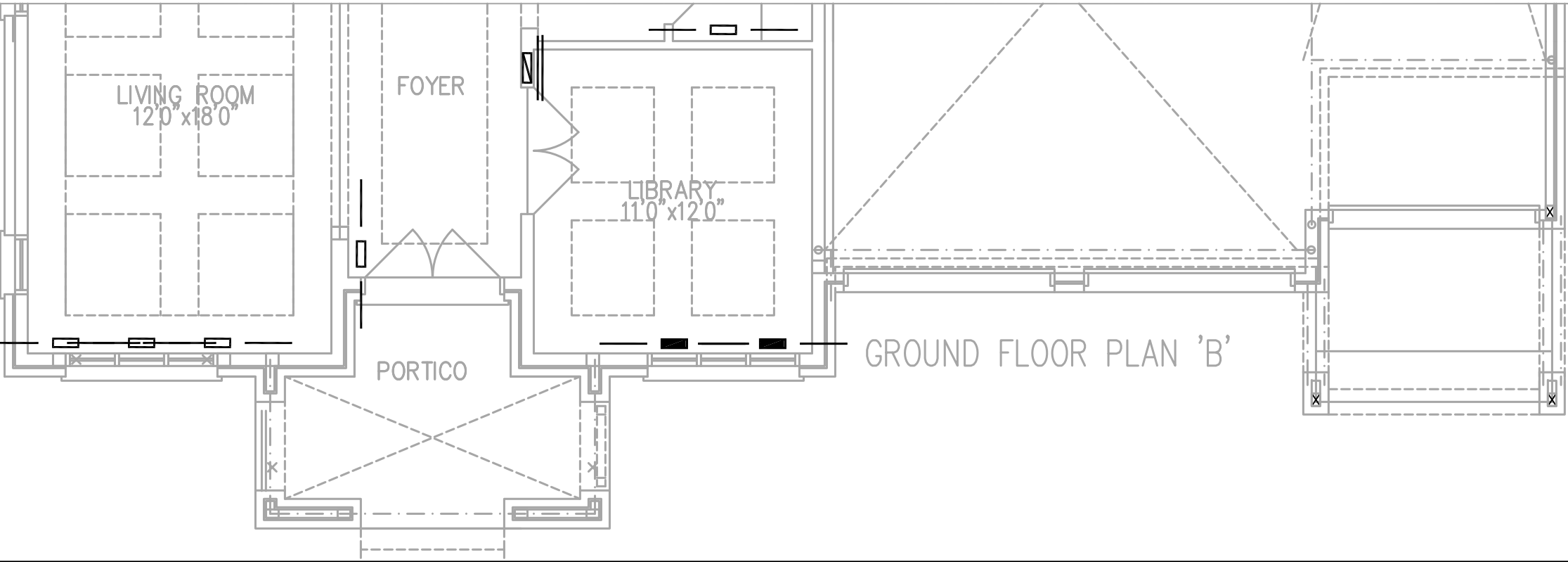
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PART. GROUND FLOOR PLAN
W/ ELEVATOR COND.
(‘B’ SIMILAR)

3	REVISED AS PER CAD	JULY/2024	HR
2	REVISED TO PERFORMANCE PATH	APR/2022	KB
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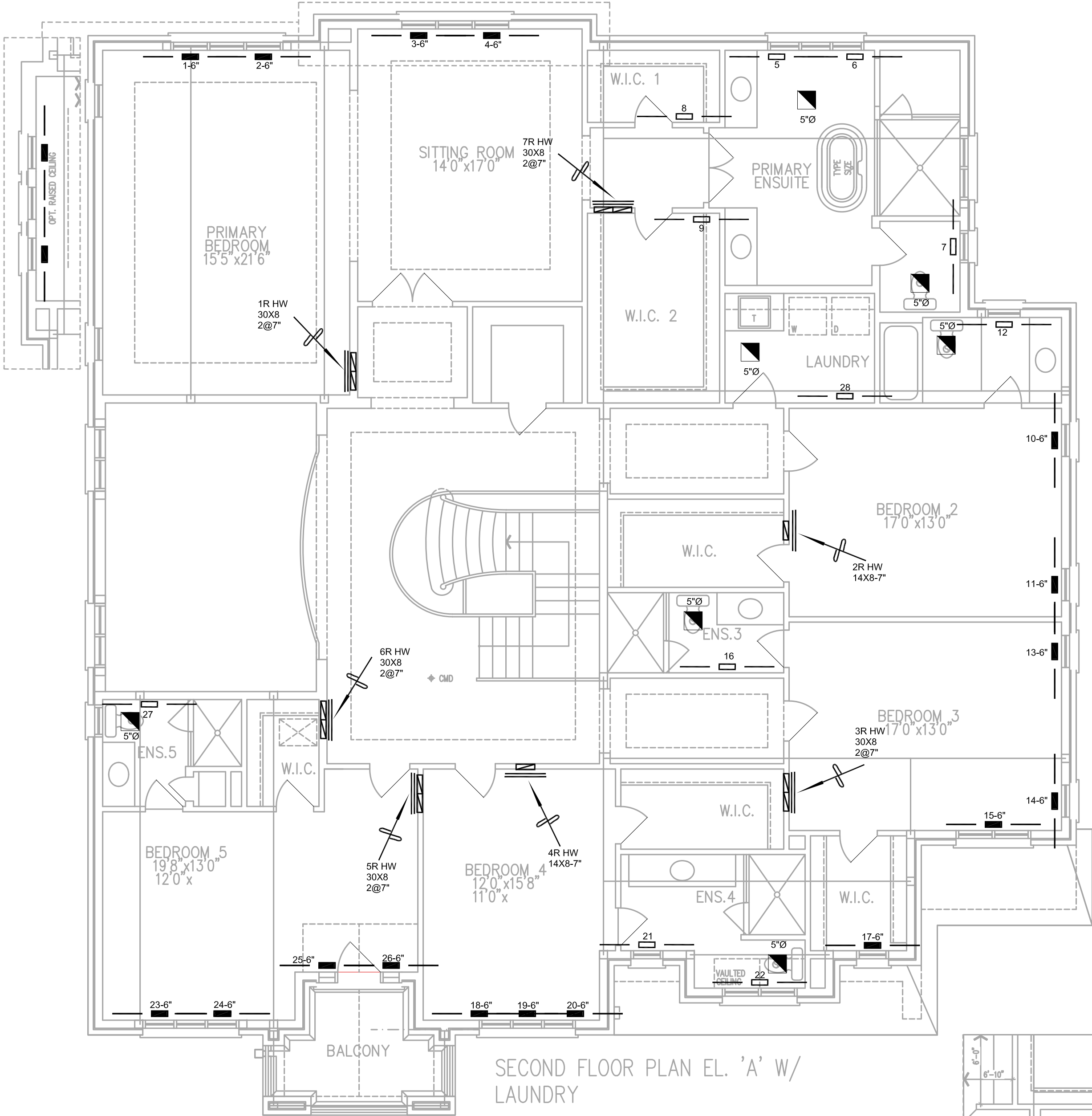
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Drawn By	HR	Checked By MO
Scale	3/16"=1'-0"	Sheet No.
Date	MARCH 2022	2
LO #	95350	3

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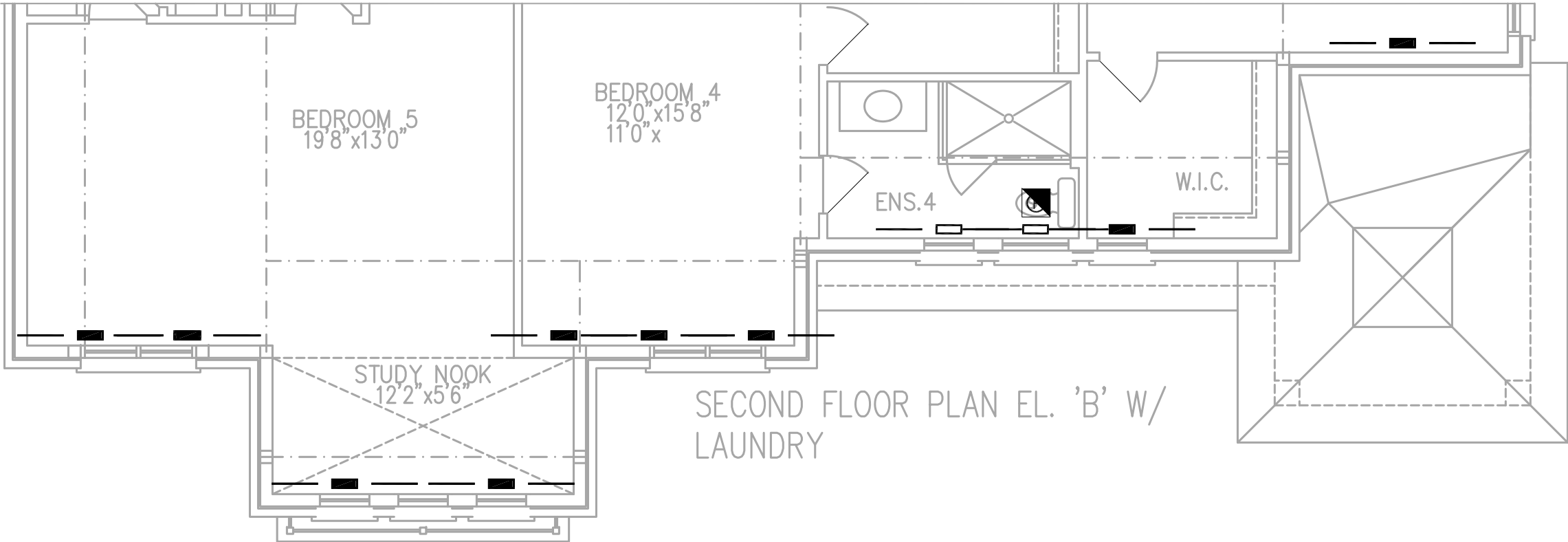
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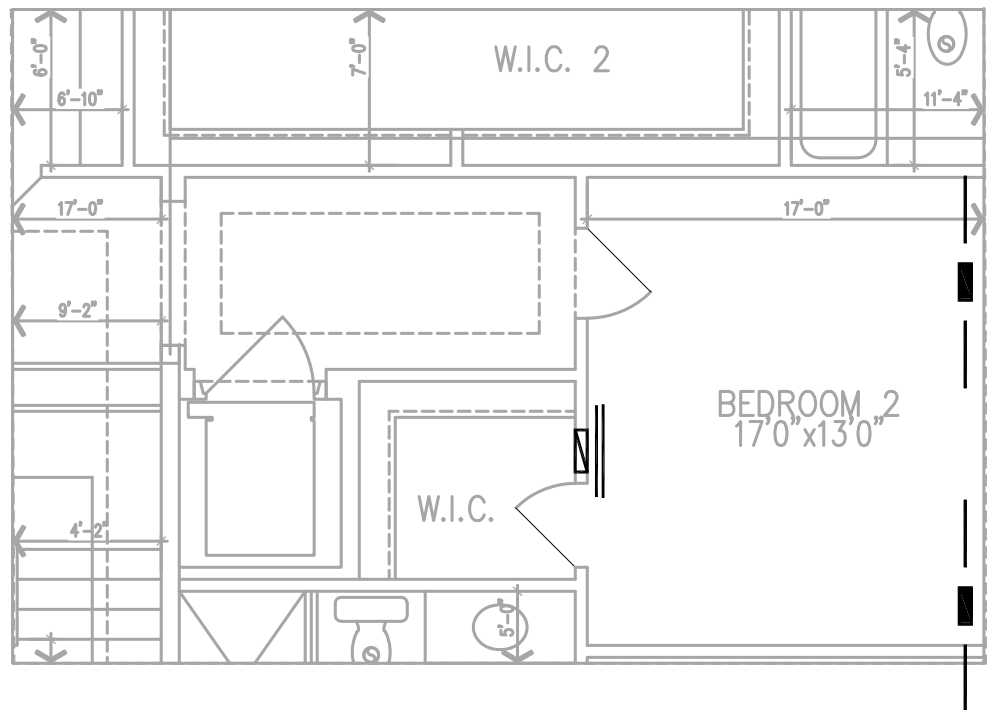
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SECOND FLOOR PLAN EL. 'A' W/
LAUNDRY



SECOND FLOOR PLAN EL. 'B' W/
LAUNDRY



PART. SECOND FLOOR PLAN
W/ ELEVATOR COND.
('B' SIMILAR)

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