



CITY OF EDINA

4801 West 50th Street, Edina, MN 55424

Building Inspections Department

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Job Site Address: _____

ENERGY CODE WORKSHEET FOR ONE & TWO FAMILY DWELLINGS

INSTRUCTIONS: Complete Parts I, II and III. Clearly mark plans with: insulation R-values; window and skylight U-values; size and type of equipment; equipment controls; and location of interior air barrier, vapor retarder and windwash barriers. More detailed information can be found in the *Minnesota Energy Code Summary Sheets* available from the Minnesota Department of Public Service.

Part I. BUILDING ENVELOPE

- Check option used: "Cookbook" Method (complete worksheet below) MnCheck method (attach report)
 Building Component method (attach calculations) Systems Analysis method (attach analysis)

"Cookbook" Worksheet

INSTRUCTIONS

- Step 1. Check item(s) that design meets on *Minimum Requirements* list to the right. Must meet all items to use Cookbook option.
- Step 2. Indicate proposed wall type on table below.
- Step 3. Indicate Window U-value and source.
- Step 4. Verify total window (including area of all foundation windows) & door area is equal or less than allowable percentage

MINIMUM REQUIREMENTS (for "Cookbook" Option)	
<input type="checkbox"/>	Heating system efficiency: Minimum 90% AFUE
<input type="checkbox"/>	Entry Doors: 1 1/4" solid wood or maximum U-value of 0.40
<input type="checkbox"/>	Skylights: None permitted
<input type="checkbox"/>	Ceiling Insulation: Minimum R-38
<input type="checkbox"/>	Rim Joist Insulation: Minimum R-10
<input type="checkbox"/>	Floors over unconditioned spaces: Minimum R-30
<input type="checkbox"/>	Foundation windows: 1/2" insulated glass in wood or vinyl frame or maximum U-value of 0.51

TABLE FOR DETERMINING MAXIMUM WINDOW AND DOOR AREA

Maximum Allowable Total Window and Door Area as a Percentage of Exposed Wall →	10%	12%	14%	16%	18%	20%	22%	24%	26%	28%
Wall Type (R-5 up to R-10 Foundation Insul.):	Maximum Average Window U-value (except foundation windows ≤ 5.6 sf):									
<input type="checkbox"/> 2x4, R-13 insulation, < R-5 sheathing	0.37	0.36	0.30	0.26	0.23	0.20	0.18	0.16	0.15	0.14
<input type="checkbox"/> 2x4, R-13 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.35	0.31	0.28	0.25	0.23	0.22
<input type="checkbox"/> 2x4, R-13 insulation, ≥ R-7 sheathing	0.37	0.37	0.37	0.37	0.37	0.34	0.31	0.28	0.26	0.24
<input type="checkbox"/> 2x6, R-19 insulation, < R-5 sheathing	0.37	0.37	0.37	0.37	0.34	0.31	0.28	0.25	0.23	0.21
<input type="checkbox"/> 2x6, R-19 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.37	0.33	0.30	0.28	0.26
<input type="checkbox"/> 2x6, R-21 insulation, < R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.33	0.30	0.27	0.25	0.23
<input type="checkbox"/> 2x6, R-21 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.37	0.35	0.31	0.29	0.27
Wall Type (with R-10 Foundation Insulation):	Maximum Average Window U-value (except foundation windows ≤ 5.6 sf):									
<input type="checkbox"/> 2x4, R-13 insulation, < R-5 sheathing	0.37	0.37	0.33	0.28	0.25	0.22	0.20	0.18	0.17	0.15
<input type="checkbox"/> 2x4, R-13 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.33	0.30	0.27	0.25	0.23
<input type="checkbox"/> 2x4, R-13 insulation, ≥ R-7 sheathing	0.37	0.37	0.37	0.37	0.37	0.36	0.33	0.30	0.27	0.25
<input type="checkbox"/> 2x6, R-19 insulation, < R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.32	0.29	0.27	0.24	0.23
<input type="checkbox"/> 2x6, R-19 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.37	0.35	0.32	0.29	0.27
<input type="checkbox"/> 2x6, R-21 insulation, < R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.35	0.31	0.29	0.26	0.24
<input type="checkbox"/> 2x6, R-21 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.33	0.30	0.28
Wall Type (with R≥19 Foundation Insulation):	Maximum Average Window U-value (except foundation windows ≤ 5.6 sf):									
<input type="checkbox"/> 2x4, R-13 insulation, < R-5 sheathing	0.37	0.37	0.34	0.29	0.26	0.23	0.21	0.19	0.17	0.16
<input type="checkbox"/> 2x4, R-13 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.34	0.31	0.28	0.26	0.24
<input type="checkbox"/> 2x4, R-13 insulation, ≥ R-7 sheathing	0.37	0.37	0.37	0.37	0.37	0.37	0.34	0.31	0.28	0.24
<input type="checkbox"/> 2x6, R-19 insulation, < R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.34	0.30	0.28	0.25	0.23
<input type="checkbox"/> 2x6, R-19 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.33	0.30	0.28
<input type="checkbox"/> 2x6, R-21 insulation, < R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.36	0.32	0.29	0.27	0.25
<input type="checkbox"/> 2x6, R-21 insulation, ≥ R-5 sheathing	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.34	0.31	0.29

Window U-value: Source: NFRC Code Default Table (see Part 7670.0700)

100 X ÷ = % ≤ %
 window & door area gross exposed wall area DESIGN ALLOWABLE (from table above)

Part II. DEPRESSURIZATION PROTECTION

Check option used: Aggregate (complete aggregate worksheet on next page) Prescriptive (complete worksheet below)
 Performance (submit test report prior to final inspection) No fuel burning equipment

PRESCRIPTIVE PATH WORKSHEET

INSTRUCTIONS

- Step 1. Complete the *Combustion Equipment Schedule* on the right.
- Step 2. Choose a *Make-up Air Path* with a Y (Yes) for all selected equipment.
- Step 3. Complete the table below for the *Make-up Air Path* chosen, indicating flows in cfm for exhaust and make-up air methods proposed. Only the capacity of largest exhaust appliance in each category need be considered.
- Step 4. Fill out the *Passive Make-up Air Opening Schedule* on the next page.

COMBUSTION EQUIPMENT SCHEDULE (check all types proposed)		Permitted Equipment			
		Path 0	Path 1	Path 2	Path 3
Space heating	<input type="checkbox"/> Sealed combustion	Y	Y	Y	Y
	<input type="checkbox"/> Direct or power vented	N	Y	Y	Y
	<input type="checkbox"/> Atmospherically vented	N	N	Y*	Y
Water heating	<input type="checkbox"/> Sealed combustion	Y	Y	Y	Y
	<input type="checkbox"/> Direct or power vented	N	Y	Y	Y
	<input type="checkbox"/> Atmospherically vented	N	N	N	Y
Hearth – gas	<input type="checkbox"/> Sealed combustion	Y	Y	Y	Y
	<input type="checkbox"/> Direct or power vented	N	Y	Y	Y
	<input type="checkbox"/> Atmospherically vented	N	N	Y*	N
Hearth – solid fuel	<input type="checkbox"/> Closed controlled	N	Y	Y*	N
	<input type="checkbox"/> Decorative	N	N	Y*	N

* Only one atmospherically vented appliance may be installed in Prescriptive Path 2

<input type="checkbox"/> Path 0 – Prescriptive Make-up Air Method		Exhaust	Passive Infiltration	Passive Opening	Powered Make-up
Clothes dryer:	Passive infiltration for up to 175 cfm Passive openings for cfm's over 175				
Kitchen exhaust:	Passive infiltration for up to 250 cfm Passive openings for cfm's over 250 Powered to match flow for cfm's over 500				
Other exhaust: †	Passive openings for up to 140 cfm Powered to match flow for cfm's over 140		N/A		
† Need not include central vacuum exhaust in Path 0. TOTALS					
<input type="checkbox"/> Path 1 – Prescriptive Make-up Air Method		Exhaust	Passive Infiltration	Passive Opening †	Powered Make-up
Clothes dryer: †	Passive infiltration for up to 175 cfm Passive openings for cfm's over 175				
Kitchen exhaust:	Passive openings for up to 250 cfm Powered to match flow for cfm's over 250		N/A		
Other exhaust: †	Passive openings for up to 140 cfm Powered to match flow for cfm's over 140		N/A		
TOTALS					
If closed controlled combustion solid-fuel burning appliance is installed in Path 1, then the clothes dryer and any central vacuum that exhausts to outside must be provided with make-up air by passive opening to match flow. Otherwise need not include central vacuum.					
<input type="checkbox"/> Path 2 – Prescriptive Make-up Air Method		Exhaust	Passive Infiltration	Passive Opening	Powered Make-up
Clothes dryer:	Passive openings for up to 175 cfm Powered to match flow for cfm's over 175		N/A		
Kitchen exhaust:	Powered to match flow		N/A	N/A	
Other exhaust:	Powered to match flow		N/A	N/A	
TOTALS			N/A	N/A	
<input type="checkbox"/> Path 3 – Prescriptive Make-up Air Method		Exhaust	Passive Infiltration	Passive Opening	Powered Make-up
Clothes dryer:	Powered to match flow		N/A	N/A	
Kitchen exhaust:	Powered to match flow		N/A	N/A	
Other exhaust:	Powered to match flow		N/A	N/A	
TOTALS			N/A	N/A	

PASSIVE MAKE-UP AIR OPENING SCHEDULE

TABLE FOR SIZING PASSIVE MAKE-UP AIR OPENINGS		Diameter	Path 0	Path 1	Path 2
Notes: a) This table assumes 20 feet of smooth unobstructed round duct with three 90° elbows and a screened hood b) Equivalent designs calculated using pressures of 50 Pascals for Path 0, 25 Pascals for Path 1, and 5 Pascals for Path 2 may be used. c) If a make-up air opening is used with no duct or elbows, the diameter can be decreased by 1 inch. d) If flex duct is used, increase diameter by 1 inch.	3 inches	50 cfm	35 cfm	15 cfm	
	4 inches	90 cfm	60 cfm	30 cfm	
	5 inches	140 cfm	100 cfm	45 cfm	
	6 inches	200 cfm	140 cfm	65 cfm	
	7 inches	270 cfm	190 cfm	85 cfm	
	8 inches	350 cfm	250 cfm	110 cfm	
	9 inches	450 cfm	320 cfm	140 cfm	
	10 inches	570 cfm	400 cfm	180 cfm	

Make-up Air Application/Location	CFM	Opening size	Duct Type		
			<input type="checkbox"/> Smooth	<input type="checkbox"/> Flex	<input type="checkbox"/> Opening only
			<input type="checkbox"/> Smooth	<input type="checkbox"/> Flex	<input type="checkbox"/> Opening only
			<input type="checkbox"/> Smooth	<input type="checkbox"/> Flex	<input type="checkbox"/> Opening only
			<input type="checkbox"/> Smooth	<input type="checkbox"/> Flex	<input type="checkbox"/> Opening only

AGGREGATE MAKE-UP AIR WORKSHEET

INSTRUCTIONS

- Step 1. Complete *Exhaust Schedule* on the right indicating cfm of largest device in each category.
- Step 2. Complete the *Combustion Equipment Schedule* on preceding page.
- Step 3. Choose a path with a Y (Yes) for all selected equipment.
- Step 4. Complete *Aggregate Make-up Air* table below for chosen path. Using the total cfm from the *Exhaust Schedule*, indicate flow in cfm for proposed method(s) of providing make-up air.
- Step 5. Fill out the *Passive Make-up Air Opening Schedule* above.

EXHAUST SCHEDULE	
DEVICE	CFM
Clothes dryer	
Kitchen exhaust	
Other exhaust	
TOTAL	

<input type="checkbox"/> Path 0 – Aggregate Make-up Air Method	Passive Infiltration	Passive Opening	Powered Make-up
Passive infiltration for up to 425 cfm Passive openings for cfm's over 425 Powered to match flow for cfm's over 985			
<input type="checkbox"/> Path 1 – Aggregate Make-up Air Method	Passive Infiltration	Passive Opening*	Powered Make-up
Passive infiltration up to 175 cfm* Passive openings for cfm's over 175 Powered to match flow for cfm's over 565			
* If a closed controlled solid-fuel burning appliance is installed in Path 1, then a passive opening must be installed to provide make-up air for the clothes dryer and for any central vacuum that exhausts to the outside.			
<input type="checkbox"/> Path 2 – Aggregate Make-up Air Method	Passive Infiltration	Passive Opening	Powered Make-up
Passive openings for up to 175 cfm Powered to match flow for cfm's over 175	N/A		
<input type="checkbox"/> Path 3 – Aggregate Make-up Air Method	Passive Infiltration	Passive Opening	Powered Make-up
Powered to match flow	N/A	N/A	

Part IIIa. VENTILATION

INSTRUCTIONS

- Step 1. Complete the *Ventilation Quantity* worksheet below.
 Step 2. Check the Make-up Air Path (from Part II) on the *Ventilation Methods* table below.
 Step 3. Choose permitted method(s) for People and Supplemental Ventilation from the *Ventilation Methods* table.
 Step 4. Complete the *Ventilation Fan Schedule*.

VENTILATION QUANTITY								
TOTAL VENTILATION:	0.05 cfm/sf	x		sf =		cfm		
conditioned floor area normally including basement								
PEOPLE VENTILATION:	(x 15 cfm/bedroom)	+ 15 cfm	=		cfm	
		# of bedrooms						
SUPPLEMENTAL VENTILATION:		cfm	-		cfm	=		cfm
		total ventilation		people ventilation				

VENTILATION METHODS			
MAKE-UP AIR PATH (from Part II)	PEOPLE	SUPPLEMENTAL	CO-ALARM
<input type="checkbox"/> Prescriptive (or Aggregate) Path 0	Balanced or Exhaust only	Balanced or Exhaust only*	Not required
<input type="checkbox"/> Prescriptive (or Aggregate) Path 1	Balanced or Exhaust only	Balanced or Exhaust only*	Not required†
<input type="checkbox"/> Prescriptive (or Aggregate) Path 2	Balanced	Balanced or Exhaust only*	Required
<input type="checkbox"/> Prescriptive (or Aggregate) Path 3	Balanced	Balanced	Required
<input type="checkbox"/> Performance Path (see part 7672.1000 subpart 7)	Performance	Performance	Required

* Passive infiltration shall not be used to provide make-up air for exhaust only supplemental ventilation in excess of 0.05 cfm/sf.
 † A carbon monoxide alarm must be installed if a controlled combustion solid-fuel burning appliance is installed in Path 1.

VENTILATION FAN SCHEDULE						
Fan description or location						TOTALS
Fan Purpose		<input type="checkbox"/> People	<input type="checkbox"/> People	<input type="checkbox"/> People	<input type="checkbox"/> People	cfm
		<input type="checkbox"/> Supplemental	<input type="checkbox"/> Supplemental	<input type="checkbox"/> Supplemental	<input type="checkbox"/> Supplemental	cfm
VENTILATION AS DESIGNED	Intake	cfm	cfm	cfm	cfm	cfm
	Exhaust	cfm	cfm	cfm	cfm	cfm

Statement of Compliance: The proposed building design represented in these documents is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the requirements of the Minnesota Energy Code.

Applicant (print name) _____ Signature _____ Date _____ Telephone number _____

Part IIIb. VENTILATION (Submit Part IIIb upon completion of system verification)

Job Site Address: _____ Permit Number _____

Fan description or location						TOTALS
MEASURED PERFORMANCE	Intake*	cfm	cfm	cfm	cfm	cfm
	Exhaust*	cfm	cfm	cfm	cfm	cfm

*Measurement required for ventilation system intakes and exhausts from the building with design air flow of 30 cfm and greater.

Compliance Statement: Installed ventilation system is in compliance with MN Energy Code and is sized to provide the design air flow.

Applicant (print name) _____ Signature _____ Date _____ Telephone number _____