



City of Detroit Lakes

1025 Roosevelt Ave., P.O. Box 647 Detroit Lakes, MN 56502

SUBMITTAL DOCUMENTS CHECKLIST NEW HOME/ADDITION

Permit # _____

Owner: _____ Phone: _____

Contractor: _____ Phone: _____

Address: _____

Item	Included	Comments
2 sets of Building Plans		Minimum Size 11 x 17"
Site Plan to Scale		
Exterior Elevations		
Foundation Plan		Include Dimensions
Detailed Floor Plans		
Radon Control System		
Detailed Cross Section		
Stair Section		
Roof Framing Plan		
Window Schedule		
Structural Calculations		Design Professional (Engineer)
Roof		
Floor		
Foundation		
Energy Compliance		Complete New Construction Energy Code Compliance Form
Insulation Materials and R-values		
Fenestration U-factors and SHGC's		
Area-weighted U-Factor and SHGC calcs		
Mechanical System Design Criteria		
Equipment and systems controls		
Fan Motor Horsepower (hp) and controls		
Duct Sealing and location		
Insulation of Ducts and Pipes		
Lighting Fixture Schedule with Wattage		
Control Narrative and Air Sealing		

Required Document Submittals:

The following is a partial summary of plan review for a single-family dwelling and should include but not be limited to the following items:

1. Provide a survey/site plan showing lot size, building size, setbacks from property lines, other buildings, sewer/ water, septic systems, wells, and any other items required by code or ordinance.
2. Two sets of complete plans and specifications to be reviewed and approved. One for the building department and one to be on site.
3. Energy code compliance certificate.
4. Minimum ventilation requirements Minnesota Energy Code 1322 Chapter 4.
5. Residential combustion air calculations IFGC 304.1 I.F.G.C. Appendix E, worksheet E-1
6. Residential makeup air calculations. I.M.C 501.4. 1 I.M.C. Chapter 5 Table 501.4.1
7. Provide floor plans for all levels. Include room size, room use, kitchen and bathroom layout, dimensions of stairway and location, window and door location with sizes, and decks and porches.
8. Provide all exterior elevations showing top of foundation in relation to final grade, grading and drainage, windows, doors, siding type, roof pitch, roof covering, decks and miscellaneous.
9. Provide a typical wall section or section through the building. The following items should include but not limited to:
 - Footing size and reinforcing if required
 - Foundation size, type, height, and reinforcing
 - Foundation anchor size, type, and spacing
 - Foundation drainage (drain tile)
 - Foundation waterproofing (membrane)
 - Foundation insulation type, R value, and vapor retarder
 - Rim joist insulation type, location and sealing
 - Floor joist type, size, and spacing
 - Subfloor type, size, and thickness
 - Stud, size, and spacing
 - Wall sheathing type and size
 - Water- Resistive Barrier (Building paper/house wrap)

- Exterior wall finish type and application
- Insulation type and R value
- Vapor retarder type
- Interior wall finish
- Roof rafter or trusses, size, and spacing
- Subfascia/fascia type and size
- Soffit system type and size
- Eave Baffle (wind wash barrier)
- Soffit ventilation
- Roof pitch indicator
- Roof underlayment and eave protection
- Roof covering
- Roof/attic ventilation
- Roof Sheathing

Structural:

- Provide all header,
- beams, post size,
- location of braced wall lines,
- braced wall panel design,
- all structural elements should be specified.
- Certified roof truss drawings floor truss drawings and all engineered drawings shall be required.
- Truss drawings and all engineered drawings are required on site at the framing inspection.

Non-structural:

- Show location and specification of smoke detectors
- Show location and specification of handrails, guardrails, and rise and run of stairways
- Verify location and requirements for egress windows and/or doors
- Verify requirements for safety glazing and location
- Verify bathrooms for minimum space requirements
- Verify ventilation requirements for bathroom
- Verify fire protection as required for common wall between house and garage and floor system.

New Construction Energy Code Compliance Certificate

Per R401.3 Certificate. A building certificate shall be posted on or in the electrical distribution panel.

Date Certificate Post

Place your logo here

Mailing Address of the Dwelling or Dwelling Unit	City
Name of Residential Contractor	MN License Number

THERMAL ENVELOPE										RADON CONTROL SYSTEM	
Insulation Location	Total R-Value of all Types of Insulation	Type: Check All That Apply								Passive (No Fan)	
		Non or Not Applicable	Fiberglass, Blown	Fiberglass, Batts	Foam, Closed Cell	Foam Open Cell	Mineral Fiberboard	Rigid, Extruded Polystyrene	Rigid, Isocyanurate	Active (With fan and monometer or other system monitoring device)	
										Location (or future location) of Fan:	
										Other Please Describe Here	
Below Entire Slab											
Foundation Wall											
Perimeter of Slab on Grade											
Rim Joist (1st Floor)											
Rim Joist (2nd Floor+)											
Wall											
Ceiling, flat											
Ceiling, vaulted											
Bay Windows or cantilevered areas											
Floors over unconditioned area											
Describe other insulated areas											

Building envelope air tightness:	Duct system air tightness:
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Windows & Doors		Heating or Cooling Ducts Outside Conditioned Spaces	
Average U-Factor (excludes skylights and one door) U:		Not applicable, all ducts located in conditioned space	
Solar Heat Gain Coefficient (SHGC):		R-value	

MECHANICAL SYSTEMS						Make-up Air <i>Select a Type</i>	
Appliances	Heating System		Domestic Water Heater	Cooling System		Not required per mech. code	
Fuel Type						Passive	
Manufacturer						Powered	
Model						Interlocked with exhaust device. Describe:	
Rating or Size	Input in BTUS:		Capacity in Gallons:		Output in Tons:		Other, describe:
Efficiency	AFUE or HSPF%				SEER /EER		Location of duct or system:
Residential Load Calculation	Heating Loss		Heating Gain		Cooling Load		
							Cfm's
							" round duct OR
							" metal duct

MECHANICAL VENTILATION SYSTEM						Combustion Air <i>Select a Type</i>	
Describe any additional or combined heating or cooling systems if installed: (e.g. two furnaces or air source heat pump with gas back-up furnace):						Not required per mech. code	
Select Type						Passive	
	Heat Recover Ventilator (HRV) Capacity in cfm's:	Low:		High:		Other, describe:	
	Energy Recover Ventilator (ERV) Capacity in cfm's:	Low:		High:		Location of duct or system:	
	Balanced Ventilation capacity in cfm's:					Cfm's	
	Location of fan(s), describe:					" round duct OR	
	Capacity continuous ventilation rate in cfm's:					" metal duct	
	Total ventilation (intermittent + continuous) rate in cfm's:						

IFGC Appendix E, Worksheet E-1

Residential Combustion Air Calculation Method (for Furnace, Boiler, and/or Water Heater in the Same Space)

Step 1: Complete vented combustion appliance information.

Furnace/Boiler:

_____ Draft Hood (Not fan assisted) _____ Fan Assisted & Power Vent _____ Direct Vent Input: _____ Btu/hr

Water Heater:

_____ Draft Hood (Not fan assisted) _____ Fan Assisted & Power Vent _____ Direct Vent Input: _____ Btu/hr

Step 2: Calculate the volume of the Combustion Appliance Space (CAS) containing combustion appliances.

The CAS includes all spaces connected to one another by code compliant openings.

CAS volume: _____ ft³

Step 3: Determine Air Changes per Hour (ACH)¹

Default ACH values have been incorporated into Table E-1 for use with Method 4b (KAIR Method). If the year of construction or ACH is not known, use method 4a (Standard Method).

Step 4: Determine Required Volume for Combustion Air.

4a. Standard Method.

Total Btu/hr input of all combustion appliances (DO NOT COUNT DIRECT VENT APPLIANCES) Input: _____ Btu/hr

Use Standard Method column in Table E-1 to find Total Required Volume (TRV) TRV: _____ ft³

If CAS Volume (from Step 2) **is greater than** TRV then no outdoor openings are needed.

If CAS Volume (from Step 2) **is less than** TRV then go to **STEP 5**.

4b. Known Air Infiltration Rate (KAIR) Method

Total Btu/hr input of all fan-assisted and power vent appliances (DO NOT COUNT DIRECT VENT APPLIANCES) Input: _____ Btu/hr

Use Fan-Assisted Appliances column in Table E-1 to find Required Volume Fan Assisted (RVFA) RVFA: _____ ft³

Total Btu/hr of all non-fan-assisted appliances Input: _____ Btu/hr

Use Non-Fan-Assisted Appliances column in Table E-1 to Find Required Volume Non-Fan-Assisted (RVNFA)

RVNFA: _____ ft³

Total Required Volume (TRV) = RVFA + RVNFA

$$\text{TRV} = \text{_____} + \text{_____} = \text{_____} \text{ ft}^3$$

If CAS Volume (from Step 2) **is greater than** TRV then no outdoor openings are needed.

If CAS Volume (from Step 2) **is less than** TRV then go to **STEP 5**.

Step 5: Calculate the ratio of available interior volume to the total required volume.

Ratio = CAS Volume (from Step 2) **divided by** TRV (from Step 4a or Step 4b)

$$\text{Ratio} = \text{_____} / \text{_____} = \text{_____}$$

Step 6: Calculate Reduction Factor (RF).

$$\text{RF} = 1 \text{ minus Ratio} \quad \text{RF} = 1 - \text{_____} = \text{_____}$$

Step 7: Calculate single outdoor opening as if all combustion air is from outside.

Total Btu/hr input of all Combustion Appliances in the same CAS (EXCEPT DIRECT VENT)

Input: _____ Btu/hr

Combustion Air Opening Area (CAOA):

Total Btu/hr **divided by** 3000 Btu/hr per in²

$$\text{CAOA} = \text{_____} / 3000 \text{ Btu/hr per in}^2 = \text{_____} \text{ in}^2$$

Step 8: Calculate Minimum CAO A

Minimum CAO A = CAO A **multiplied by** RF

$$\text{Minimum CAO A} = \text{_____} \times \text{_____} = \text{_____} \text{ in}^2$$

Step 9: Calculate Combustion Air Opening Diameter (CAOD)

CAOD = 1.13 **multiplied by the square root of** Minimum CAO A

$$\text{CAOD} = 1.13 \text{ Minimum CAO A} = \text{_____} \text{ in}$$

¹ If desired, ACH can be determined using ASHRAE calculation or blower door test. Follow procedures in Section G304.

Table 501.4.1

PROCEDURE TO DETERMINE MAKEUP AIR QUANTITY FOR EXHAUST APPLIANCES IN DWELLING UNITS

	One or multiple power vent or direct vent appliances or no combustion appliances ^A	One or multiple fan-assisted appliances and power vent or direct vent appliances ^B	One atmospherically vented gas or oil appliance or one solid fuel appliance ^C	Multiple appliances that are atmospherically vented gas or oil appliances or solid fuel appliances ^D
1. Use the Appropriate Column to Estimate House Infiltration				
a) pressure factor (cfm/sf)	0.15	0.09	0.06	0.03
b) conditioned floor area (sf) (including unfinished basements)				
Estimated House Infiltration (cfm): [1a x 1b]				
2. Exhaust Capacity				
a) clothes dryer	135	135	135	135
b) 80% of largest exhaust rating (cfm): (not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)				
c) 80% of next largest exhaust rating (cfm): (not applicable if recirculating system or if powered makeup air is electrically interlocked and matched to exhaust)	not applicable			
Total Exhaust Capacity (cfm): [2a+2b+2c]				
3. Makeup Air Requirement				
a) Total Exhaust Capacity (from above)				
b) Estimated House Infiltration (from above)				
Makeup Air Quantity (cfm): [3a - 3b] (if value is negative, no makeup air is needed)				
4. For Makeup Air Opening Sizing, refer to Table 501.4.2				

^AUse this column if there are other than fan-assisted or atmospherically vented gas or oil appliances or if there are no combustion appliances.

^BUse this column if there is one fan-assisted appliance per venting system. Other than atmospherically vented appliances may also be included.

^CUse this column if there is one atmospherically vented (other than fan-assisted) gas or oil appliance per venting system or one solid fuel appliance.

^DUse this column if there are multiple atmospherically vented gas or oil appliances using a common vent or if there are atmospherically vented gas or oil appliances and solid fuel appliances.

TABLE 501.4.2

MAKEUP AIR OPENING SIZING TABLE FOR NEW AND EXISTING DWELLING UNITS

TYPE OF OPENING OR SYSTEM	ONE OR MULTIPLE POWER VENT OR DIRECT VENT APPLIANCES OR NO COMBUSTION APPLIANCES ^A	ONE OR MULTIPLE FAN- ASSISTED APPLIANCES AND POWER VENT OR DIRECT VENT APPLIANCES ^B	ONE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCE OR ONE SOLID FUEL APPLIANCE ^C	MULTIPLE APPLIANCES THAT ARE ATMOSPHERICALLY VENTED GAS OR OIL APPLIANCES OR SOLID FUEL APPLIANCES ^D	PASSIVE MAKEUP AIR OPENING DUCT DIAMETER ^{E, F, G}
	(cfm)	(cfm)	(cfm)	(cfm)	(inches)
Passive opening	Jan-36	22-Jan	15-Jan	9-Jan	3
Passive opening	37-66	23-41	16-28	17-Oct	4
Passive opening	67-109	42-66	29-46	18-28	5
Passive opening	110-163	67-100	47-69	29-42	6
Passive opening	164-232	101-143	70-99	43-61	7
Passive opening	233-317	144-195	100-135	62-83	8
Passive opening with motorized damper	318-419	196-258	136-179	84-110	9
Passive opening with motorized damper	420-539	259-332	180-230	111-142	10
Passive opening with motorized damper	540-679	333-419	231-290	143-179	11
Powered makeup air ^H	> 679	> 419	> 290	> 179	Not Applicable

^A Use this column if there are other than fan-assisted or atmospherically vented gas or oil *appliances* or if there are no *combustion appliances*.

^B Use this column if there is one fan-assisted *appliance* per venting system. Other than atmospherically vented *appliances* may also be included.

^C Use this column if there is one atmospherically vented (other than fan-assisted) gas or oil *appliance* per venting system or one solid fuel *appliance*.

^D Use this column if there are multiple atmospherically vented gas or oil *appliances* using a common vent or if there are atmospherically vented gas or oil *appliances* and solid fuel *appliances*.

^E An equivalent length of 100 feet of round smooth metal duct is assumed. Subtract 40 feet for the exterior hood and ten feet for each 90-degree elbow to determine the remaining length of straight duct allowable.

^F If flexible duct is used, increase the duct diameter by one inch. Flexible duct shall be stretched with minimal sags.

^G Barometric dampers are prohibited in passive *makeup air* openings when any atmospherically vented *appliance* is installed.

^H Powered *makeup air* shall be electrically interlocked with the largest exhaust system.

WINDOW PERFORMANCE

Fenestration	Fenestration U-Factor		Skylight U-Factor		Glazed Fenestration SHGC	
	2009 Ch. 1322	2012 IECC	2009 Ch. 1322	2012 IECC	2009 Ch. 1322	2012 IECC
6	0.35	0.32	0.60	0.55	N/A	N/A
7	0.35	0.32	0.60	0.55	N/A	N/A