

## Building & Plumbing Inspections

For all inspection requests see below:

Matt Munter 218-391-3745

[MMunter@TownofThomsonMN.gov](mailto:MMunter@TownofThomsonMN.gov)

[Permits@TownofThomsonMN.Gov](mailto:Permits@TownofThomsonMN.Gov)

### **Building Inspections:**

Building Inspections will be done by appointment only. A **48 hours notice** is requested for all inspections. Both inspectors work outside of the Town Office during regular business hours. There will be no in-office hours at this time.

Work requiring inspections must be complete at the time of the inspection. Your cooperation in observing these procedures will eliminate the necessity of recalls and enable us to provide better service.

If you have any questions, you may call the Town Office 218-879-9719 or contact the above listed official for your address.

### **Plumbing Inspections:**

Plumbing inspections are handled in the same manner. Please provide at least 48 hours notice.

**For a list of required inspections, please refer to the information given at the time of application.**

Town of Thomson, Carlton County  
25 Harney Road East, PO Box 92  
Esko, Minnesota  
(218) 879-9719

NEW HOME AND ADDITION PLAN CHECKLIST  
(INCLUDING GARAGES, SCREEN PORCHES, SHEDS, GAZEBOS, ETC.)

The following items MUST BE INDICATED on the plan pages before submitting for review. Verify ALL items that apply are on your plans, then sign, date, and return the checklist.

1. Foundation Plan Page showing all of the following:

- Footing Type (*Strip, Pad, Pier, Etc.*) 5000 PSI
- Footing Size and spacing
- Footing Location
- Footing Reinforcement

2. Framing Plan Page (Each Level on a Separate Page) showing all of the following:

- Room Description (Bedroom, Great Room, Kitchen, Etc.)
- Ceiling Height of All Rooms
- Garage/House Separation Including Rated Door to House
- All Walls and Openings (*Bearing and Non-Bearing*)
- All Header/Beam Type and Size at Location
- Floor Framing Type (*Concrete, Joist, Trusses, Etc.*)
- Floor Framing Size and Spacing
- Roof Framing Type (*Trusses, Rafters, Etc.*)
- Roof Framing Size and Spacing
- Crawl space Access Location
- Attic Access Location - Power supply receptacle for potential Active Radon System
- All Deck and/or Porch Framing Details
- Window sizes, locations, & types. For Egress Windows, also give the net clear opening.

3. Cross-Section Plan Page showing all of the following:

- Footing Size and Depth
- Foundation Wall Type and Size (*Block, ICF, Poured, Etc.*)
- Foundation Wall Reinforcement
- Foundation Wall Height and Grade Line
- Foundation Wall Exterior Waterproofing Type and Specs (*Poly-Wall, Tuff-N-Dri, Watchdog, Etc.*)
- Foundation Wall Interior Moisture Barrier (Against Foundation Wall)
- Foundation Wall Interior Framing Stud Size and Spacing
- Foundation Wall Interior Insulation type and R-Value (R-10 outside R-5 Inside)

(NEXT PAGE)

3. (Continued)

- Foundation Wall Interior Vapor Barrier (Warm Side of Insulation)
- Foundation Wall Interior Covering (Drywall, Paneling, Etc.)
- Treated Sill Plate Size
- Sill Bolt Size and Spacing
- Rim Joist Insulation Type, R-Value and Specs (*Comfort Foam, Duraseal, Icynene, Thermax, Etc.*)
- Deck and/or Porch Attachment at Insulated Rim
- Exterior Wall Covering (*Vinyl Siding, Cedar Shakes, Stucco, Stone Veneer, Brick, Etc.*)
- Exterior Wall Weather Barrier (*Tyvek, 2 Layers Grade-D Paper, Etc.*)
- Exterior Wall Sheathing Type and Size (*OSB, Plywood, Etc.*)
- Exterior Wall Framing Size and Spacing (Studs, Plates, Etc.)
- Exterior Wall Insulation Type and R-Value (R-21)
- Exterior Wall Interior Vapor Barrier (Warm Side of Insulation)
- Exterior Wall Interior Covering (Drywall, T & G Paneling, Etc.)
- Rigid Wind-wash Barrier
- Roof Covering (*Asphalt Shingles, Cedar Shakes, Etc.*)
- Roof Underlayment and Ice Dam Protection
- Roof Sheathing Type and Size (*OSB, Plywood, Etc.*)
- Roof Framing Size and Spacing (Trusses, Rafters, Etc.)
- Attic Ventilation (*1" Air Space, Air Chutes, Vents, Etc.*)
- Attic Insulation Type and R-Value (R-49)
- Ceiling Interior Vapor Barrier (Warm Side of Insulation)
- Ceiling Interior Covering (Drywall, T & G Paneling, Etc.)

4. Elevation Plan Page showing all of the following:

- All sides of New Home and/or Addition From Foundation Thru Roof (Including Existing Structure that Addition is to be Attached to)

5. Site Plan

- Show Entire Parcel With North/South Directional, Roadways, Driveway Access, Easements, Etc.
- Show Setbacks from ALL property lines.
- Show all Utility locations (*I.E. Well, Septic System, Sewer Line W/Tap, etc.*)
- Show all Existing Structures in addition to New Structures
- Show all Waterways on the property

6. Additional Items that must be included with plans:

- Structural Engineering for Tall Walls Over 10' High (*2-Story Entry, Vaulted Great Room, Etc.*)
- Structural Engineering for Narrow Walls, that do not meet the Braced Wall Requirements of the Code (*Gable End Garage Walls, Areas with Large Windows, Etc.*)
- Engineering for All Steel Beams

(NEXT PAGE)

6. (continued)

- Evaluation Report and Product Specs for Foundation Waterproofing
- Evaluation Report and Product Specs for Spray Foam Insulation
- Energy Code Compliance Certificate (*New Homes*)
- Smoke / Carbon Monoxide Alarm Placement
- Passive Radon System
- Carlton County Zoning approval for Waterways or Township Variance Approval
- Plumbing Permit and Specifications of Items and their placement
- HVAC Permit and Specifications of Equipment and its placement
- Building Permit Application
- Application for Zoning Certification

Other items that may be needed after plan submittal but prior to permit issuance:

- \* Electrical Permit - State of Minnesota ([www.electricity.state.mn.us](http://www.electricity.state.mn.us))  
James Kilian, Inspector 218-851-9648 (phone availability 7:00 - 8:30 AM only)
- \* Septic Permit - Carlton County Zoning Department (218-384-9176)

**SEWER SERVICE HOOK-UPS ONLY:**

- \* Sewer Hookup Permit - Thomson Township \$20.00  
(arrangements need to also be made to have a Township Sewer Representative present at time of hookup)
- \* Contractors Certificate of Insurance
- \* Check Valves - Flapper Valve for Sewer Service hookups
- \* WLSSD Fee - Must be paid for when picking up building permit
- \* Sewer Assessment/Connection Fees - Thomson Township (Must be paid prior to Hookup)

Incomplete applications will not be accepted for plan review. Plan review begins when complete applications for Building, HVAC & Plumbing are submitted.

Please allow a minimum of two weeks for plan review after submittal.

**I have looked through the plan and confirmed that all the above information is indicated on the pages being submitted.**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name

Date: \_\_\_\_\_

**THIS PLACARD MUST BE POSTED**

In a location visible to the street / Permit side out

Town of Thomson  
Official Notice of the Building Official  
Inspection Service Procedures

This handout is intended to inform permit holders of required inspections and also gain compliance with the Minnesota State Building Code.

**A 48 hour notice is requested for all inspections.**

No inspection will be made unless an appropriate permit for such work has previously been obtained.

Work requiring inspections **must be complete** at the time of inspection. Your cooperation in observing these procedures will eliminate the necessity of recalls and enable this department to provide better service.

For all inspection requests see below:

Call Matt Munter 218-391-3745  
MMunter@TownofThomsonMN.gov  
Permits @ TownofThomsonMN.gov

You may also request an inspection by contacting the Town Office at 218-879-9719 between the hours of 9:00 am and 4:00 pm .

**IT IS YOUR RESPONSIBILITY TO CALL FOR THE INSPECTIONS**

A CERTIFICATE OF OCCUPANCY (if applicable) will only be issued if the

**REQUIRED INSPECTIONS**

- \_\_\_\_\_ Footings or Slab Forms—BEFORE concrete is poured  
(Rebar must be in place at time of inspection)
  - \_\_\_\_\_ Framing
  - \_\_\_\_\_ Ingress / Egress (after framing)
  - \_\_\_\_\_ Plumbing (Underground before concrete is poured)
  - \_\_\_\_\_ Rough Plumbing (Above ground/before drywall is applied)
  - \_\_\_\_\_ Backflow Preventer—Sewer
  - \_\_\_\_\_ HVAC / Air Exchanger
  - \_\_\_\_\_ Insulation/Vapor Retarder (before wallboard is applied)
  - \_\_\_\_\_ Roof Underlayment (before shingles are applied)
  - \_\_\_\_\_ Wallboard / Sheetrock (before taping)
  - \_\_\_\_\_ House Wrap
  - \_\_\_\_\_ Blower Door Test
  - \_\_\_\_\_ Manometer Test
  - \_\_\_\_\_ Smoke & CO2 Detectors
  - \_\_\_\_\_ Radon Mitigation
  - \_\_\_\_\_ Electrical Outlet in Attic by Vent Pipe
  - \_\_\_\_\_ GFI
  - \_\_\_\_\_ Electrical Sticker-Final
  - \_\_\_\_\_ Follow up/Corrections/Other
- 
- \_\_\_\_\_ Insulation Record in Mech Room Attic & Walls R-Value
  - \_\_\_\_\_ Final—For Cert. of Occupancy (When the job is complete)



TO: New Thomson Township/Esko Residents & Businesses

Welcome to Thomson Township and the Esko community. Thomson Township has recently assigned an address for your residence or business. The US Postal Service and the Esko Post Office provides the service of rural mail delivery; however, we do not provide the mail receptacle.

Please stop in or call the Esko Post Office, at the address and phone listed at the end of this letter, regarding activating your address and establishing mail delivery. Appropriate locations for installation of mail receptacles need to be verified and approved by the Postal Service prior to installation. Purchase, installation, and maintenance of mail receptacles are the responsibility of the customer (and/or developer/builder in some cases).

We also rent Post Office Boxes as an alternative method of mail delivery which provides security, accessibility, and early morning mail pick up availability.

Postmaster  
10 W. Highway 61  
PO Box 9998  
Esko, MN 55733-9998  
218-879-3242



# Construction stormwater

When stormwater drains off a construction site, it carries sediment and other pollutants that can harm lakes, streams, and wetlands. The U.S. Environmental Protection Agency estimates that 20 to 150 tons of soil per acre are lost every year to stormwater runoff from construction sites. MPCA issues coverage to construction site owners and their operators under the Construction Stormwater general permit to prevent stormwater pollution during and after construction, and protect Minnesota's water resources.

## Who needs a permit?

You need permit coverage if you are the owner or operator for any construction activity disturbing:

- One acre or more of soil
- Less than one acre of soil, if that activity is part of a larger "common plan of development or sale" that covers more than one acre

### **Common plan of development or sale**

A common plan of development or sale – such as a subdivision, phased project, or combination of construction activities – is an area where multiple, contiguous, separate land-disturbing activities may happen on different schedules, but under one proposed plan.

Check if you need construction stormwater subdivision registration from the MPCA before construction begins. If a portion of a permitted project is sold, such as a single lot in a residential development, use the subdivision registration form (see table below)

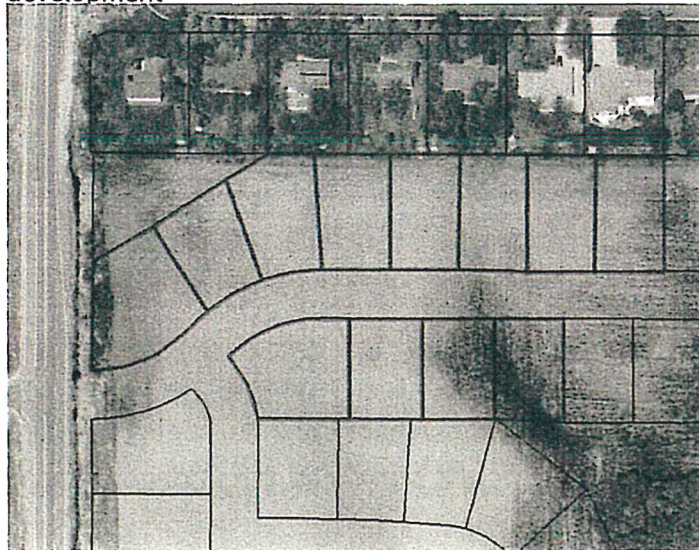
to transfer permit coverage to the new owner/contractor. This process allows a single permit covering an entire site to be broken up or “subdivided” to cover many different builders and sites.

- See:  Common plan of development (wq-strm2-22) for more information.

**Examples of common plan of development activities that require permit coverage**



Building and clearing on one 0.30-acre lot in a 30 acre development



Building and clearing on 12 lots in a 30 acre development






# Apply for coverage


See the [Steps to construction](#) page for full details on what to do before you apply. Apply for construction stormwater permit coverage online. For assistance, refer to [Getting started with MPCA e-Services](#), visit the [e-Services webpage](#), or email us at [onlineservices.pca@state.mn.us](mailto:onlineservices.pca@state.mn.us).

## Permit and program forms

Permit/application	Summary	Instructions and fact sheets
<a href="#">2018 NPDES/SDS permit for construction activity: Final permit (wq-strm2-80a)</a>	Permit Number: MN R 100001, issued on August 1, 2018.	<a href="#">Construction Stormwater Permit Overview</a>
<a href="#">Online Stormwater Permit Application</a>	Complete and submit online. Permit coverage will begin one business day after submitting a complete application.	For assistance, refer to the fact sheet <a href="#">Getting started with MPCA e-Services (p-gen1-17)</a> , visit the <a href="#">e-Services webpage</a> , or email us at <a href="mailto:onlineservices.pca@state.mn.us">onlineservices.pca@state.mn.us</a> . <a href="#">Permit application FAQs</a> If the project is located in a Tribal Reservation, you will need to obtain permit coverage from the U.S. Environmental Protection Agency.
<a href="#">Permit modification form (wq-strm2-60c)</a>	For modifying information provided on the original application	<a href="#">Guidance for stormwater permit forms (wq-strm2-60i)</a>

 Subdivision registration form (wq-strm2-60a)	For transferring permit coverage on a portion of a site already covered by the permit	See Guidance for stormwater permit forms above
 Transfer form (wq-strm2-60b)	For transferring permit coverage for an entire site to a new owner or contractor	See Guidance for stormwater permit forms above
 Notice of termination form (wq-strm2-60d)	For terminating permit coverage	See Guidance for stormwater permit forms above

*NOTE: The form titled "Notice of termination/Permit modification form" has been replaced by the last four forms listed above.*

- Developing the 2018 general permit
-  Minnesota NPDES/SDS Construction Stormwater General Permit (wq-strm2-68a) (2013)



## Special waters and impaired waters

NPDES/SDS permits for construction sites with a discharge point that flows towards, and is within one mile (aerial radius measurement) of specially protected and impaired waters require additional controls and conditions as outlined in section 23 of the General Stormwater Permit.




### Special and impaired waters search

Use this tool to identify if your construction site is within one mile of a special or impaired water.

-  Special Waters List
-  Known Calcareous Fens List
- General Information about Impaired Waters and the Current TMDL List of Impaired Waters

## Contact

- Stormwater hotline (651-757-2119, 800-657-3804)
- Online permit application: [onlineservices.pca@state.mn.us](mailto:onlineservices.pca@state.mn.us)
- Register a complaint: [Citizen complaints page](#)
- Technical assistance: See map of  Construction Stormwater staff by region



### **Minnesota Stormwater Manual**

## MN Stormwater News

Sign up for MN Stormwater News: Click to enter your email and then select "Construction Stormwater"

Well Management Section  
 Environmental Health Division  
 625 North Robert Street  
 P.O. Box 64975  
 St. Paul, Minnesota 55164-0975  
 651-201-4600 or 800-383-9808  
 health.wells@state.mn.us  
 www.health.state.mn.us/wells



## Isolation Distances From a Water-Supply Well

### Minnesota Rules, Chapter 4725 Rules Relating to Wells and Borings

The isolation distances below are from Minnesota Rules, chapter 4725. Distances must be measured horizontally from the water-supply well. Minnesota Statutes, section 103I.205, subdivision 6, prohibits constructing, placing, or installing an actual or potential contaminant source from a well that is less than the minimum distance prescribed by rule. The minimum isolation distance must be maintained between a new well and a contamination source, even if the contamination source is no longer in use. An isolation distance is not required if the contamination source and any related contaminated soil have been removed. Additional information and explanations can be found in the *Rules Handbook, A Guide to the Rules Relating to Wells and Borings* or contact the Well Management Section at the number above.

<b>Absorption area of a soil dispersal system</b>	
average flow is greater than 10,000 gallons/day.....	300 feet <sup>1</sup>
serving a facility handling infectious or pathological wastes.....	150 feet <sup>1</sup>
average flow 10,000 gallons/day or less.....	50 feet <sup>1</sup>
<b>Agricultural chemical</b>	
tank or container with 25 gallons or more or 100 pounds or more dry weight, or equipment filling or cleaning area without safeguards.....	
storage or equipment filling or cleaning area with safeguards.....	100 feet
storage or equipment filling or cleaning area with safeguards and roofed.....	50 feet
buried piping.....	50 feet
multiple tanks or containers for residential retail sale or use, no single tank or container exceeding, but aggregate volume exceeding 56 gallons or 100 pounds dry weight.....	
Anhydrous ammonia tank.....	50 feet
<b>Animal</b>	
feedlot, unroofed, 300 or more animal units.....	100 feet <sup>1</sup>
feedlot, more than 1.0, but less than 300 animal units.....	50 feet <sup>1</sup>
building or poultry building, including a horse riding area, more than 1.0 animal unit.....	
rendering plant.....	50 feet
feeding or watering area within a pasture, more than 1.0 animal unit.....	50 feet <sup>1</sup>
area to bury more than one animal unit.....	50 feet
building, feedlot, confinement area, or kennel, 0.1 to 1.0 animal unit.....	20 feet <sup>1,2</sup>
Building, building projection, deck, overhang, permanent structure.....	3 feet <sup>3</sup>
Cesspool.....	75 feet <sup>1</sup>
Cistern or reservoir, buried, nonpressurized water supply.....	20 feet
Commercial compost site.....	50 feet
Construction or demolition debris disposal area.....	50 feet <sup>1</sup>
Cooling water pond, industrial.....	50 feet <sup>1</sup>
Deicing chemicals, bulk road.....	50 feet <sup>1</sup>

Drainfield (see Absorption area)	
Dry well (sewage).....	75 feet <sup>1</sup>
Electric transmission line.....	10 feet <sup>4</sup>
Electrical transformer storage area, oil-filled.....	50 feet
Elevator boring, not conforming to rule.....	50 feet
conforming to rule.....	20 feet
Fertilizer chemigation tank, safeguarded, from irrigation well only.....	20 feet <sup>5</sup>
Floor drain, grate, or trough	
connected to a buried sewer.....	50 feet
if buried sewer is air-tested, approved materials, serving one building, or two or less single-family residences.....	20 feet <sup>2</sup>
Frost-proof yard hydrant or discharge of a frost-proof hydrant draining into the soil, fire hydrant or flushing hydrant.....	10 feet
Gas (flammable or volatile) pipe.....	10 feet <sup>4</sup>
Grave or mausoleum.....	50 feet
Gravel pocket or French drain for clear water drainage.....	20 feet
Gray-water dispersal area.....	50 feet <sup>1</sup>
<b>Hazardous substance</b>	
tank or container, above ground or underground, 56 gallons or more, or 100 pounds or more dry weight, without safeguards.....	
tank or container, above ground or underground, 56 gallons or more, or 100 pounds or more dry weight with safeguards.....	150 feet
buried piping.....	100 feet
multiple storage tanks or containers for residential retail sale or use, no single tank or container exceeding 56 gallons or 100 pounds, but aggregate volume exceeding.....	50 feet
Horizontal ground source closed loop heat exchanger buried piping.....	50 feet
Horizontal ground source closed loop heat exchanger buried piping and horizontal piping, approved materials and heat transfer fluid.....	
Household solid waste disposal area, single residence.....	10 feet <sup>2</sup>
Household solid waste disposal area, single residence.....	50 feet <sup>1</sup>
Interceptor, including a flammable waste or sediment.....	50 feet
Land spreading area for sewage, septage, or sludge.....	50 feet <sup>1</sup>
Landfill or dump, mixed municipal solid waste from multiple persons.....	300 feet <sup>1</sup>
Landfill, permitted demolition debris.....	300 feet <sup>1</sup>
Leaching pit.....	75 feet <sup>1</sup>
Liquid propane (LP) tank.....	10 feet <sup>4</sup>

Manure (liquid) storage basin or lagoon	
unpermitted or noncertified.....	300 feet <sup>1</sup>
approved earthen liner.....	150 feet <sup>1</sup>
approved concrete or composite liner .....	100 feet <sup>1</sup>
Manure (solid) storage area, not covered with a roof.....	100 feet <sup>1</sup>
Ordinary high water level of a stream, river, pond, storm water retention pond, lake, or reservoir.....	35 feet <sup>2</sup>
<b>Petroleum</b>	
tank or container, 1100 gallons or more, without safeguards .....	150 feet
tank or container, 1100 gallons or more, with safeguards.....	100 feet
tank or container, buried, between 56 and 1100 gallons.....	50 feet
tank or container, not buried, between 56 and 1100 gallons .....	20 feet <sup>6</sup>
buried piping.....	50 feet
Petroleum or crude oil pipeline to a refinery or distribution center .....	100 feet
Pit or unfilled space more than 4 feet in depth.....	20 feet
Pollutant or contaminant that may drain into the soil.....	50 feet <sup>1</sup>
Privy, nonportable.....	50 feet <sup>1</sup>
portable (privy) or toilet.....	20 feet <sup>2</sup>
Sand filter, watertight; peat filter; or constructed wetland .....	50 feet
Scrap yard.....	50 feet
Seepage pit.....	75 feet <sup>1</sup>
Septic tank.....	50 feet
Sewage holding tank, watertight.....	50 feet
Sewage sump	
capacity 100 gallons or more.....	50 feet
capacity less than 100 gallons, tested, conforming to rule .....	20 feet <sup>2</sup>
Sewage treatment device, watertight .....	50 feet
Sewer, buried	
collector, municipal, serving a facility handling infectious or pathological wastes, open-jointed or unapproved materials.....	50 feet
approved materials, tested, serving one building, or two or less single-family residences.....	20 feet <sup>2</sup>
Solid waste transfer station.....	50 feet
Storm water drain pipe, 8 inches or greater in diameter.....	20 feet <sup>2</sup>
Swimming pool, in-ground .....	20 feet
Unused, unsealed well or boring.....	50 feet
Vertical heat exchanger (vertical) piping, conforming to rule .....	35 feet <sup>2</sup>
horizontal piping conforming to rule.....	10 feet <sup>2</sup>
Wastewater rapid infiltration basin, municipal or industrial.....	300 feet <sup>1</sup>
Wastewater spray irrigation area, municipal or industrial .....	150 feet <sup>1</sup>

<b>Wastewater stabilization pond</b>	
municipal, 500 or more gallons/acre/day of leakage .....	300 feet <sup>1</sup>
municipal, less than 500 gallons/acre/day of leakage .....	150 feet <sup>1</sup>
industrial.....	150 feet <sup>1</sup>
Wastewater treatment unit tanks, vessels and components (package plant).....	100 feet
Water treatment backwash disposal area .....	50 feet <sup>1</sup>
Water treatment backwash holding basin, reclaim basin, or surge tank with a direct sewer connection.....	50 feet
with a backflow protected sewer connection.....	20 feet

**Additional Isolation Distances for Community Public Water-Supply Wells**

Highest water or flood level.....	50 feet
Property line, unless legally controlled through an easement .....	50 feet

<sup>1</sup> A sensitive water-supply well must be located at least twice the indicated distance.

A sensitive water-supply well is a well with less than 50 feet of watertight casing, and which is not cased below a confining layer or confining materials of at least 10 feet in thickness.

<sup>2</sup> A community public water-supply well must be a minimum of 50 feet from this contamination source.

<sup>3</sup> A well or boring may not be constructed inside a building except as provided for by Minnesota Rules, part 4725.2175.

<sup>4</sup> A well or boring may be located between 5 and 10 feet of an electric transmission line, gas pipe or LP tank if the well or boring is placarded, and work is not performed on the well or boring unless the electric line is deenergized and grounded or shielded, and the LP tank does not contain flammable gas.

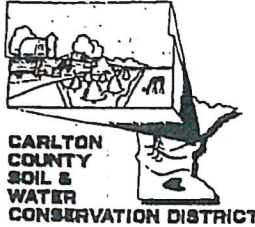
<sup>5</sup> The 20-foot distance applies only to an irrigation well and a fertilizer chemigation supply tank meeting the requirements of Minnesota Rules, chapter 1505.

<sup>6</sup> A community public water-supply well must be a minimum of 50 feet from a petroleum tank or container with a capacity between 56 and 1,100 gallons, unless the tank or container is used to fuel emergency pumping equipment and is located in a room or building separate from the community well; and is of double-wall construction with leak detection between walls; or is protected with secondary containment.

**Online Information**

- [Well Management Program \(www.health.state.mn.us/wells\)](http://www.health.state.mn.us/wells).
- [Minnesota Rules, Chapter 4725 Wells and Borings \(www.revisor.mn.gov/rules/4725/\)](http://www.revisor.mn.gov/rules/4725/).
- [Minnesota Statutes, Chapter 1031 Wells, Borings, and Underground Uses \(www.revisor.mn.gov/statutes/cite/1031\)](http://www.revisor.mn.gov/statutes/cite/1031).

To obtain this information in a different format call 651-201-4600. Printed on recycled paper.  
Publications\Isolation Distances From a Water-Supply Well 10/21/2019R



Received  
5-27-09

115 5th Street South  
PO Box 29  
Carlton, MN 55718-0029

Phone: 218-384-3891  
Email: [contact@carltonswcd.org](mailto:contact@carltonswcd.org)  
[www.carltonswcd.org](http://www.carltonswcd.org)

Dear Thomson Twp Staff,

A reminder. Though the MN Wetlands Conservation Act (WCA) does not require that every building and earth moving job gets an inspection, if there is a wetland impact there may be state and federal regulations that apply. Each project does not necessarily get a 10,000 sq ft exemption. It depends on wetland type, distance to streams, percentage of the wetland basin that's on the property, and other things. If the landowner suspects wetlands will be impacted (drained, filled, graded, or excavated) I recommend the Township recommend that the landowner contact Heather Cunningham at County Zoning.

**Supervisors:**

Barbara Dahl  
(District 1)

Larry Sampson  
(District 2)

Merrill Loy  
(District 3)

Carol Hauck  
(District 4)

Mark Thell  
(District 5)

**Staff:**

Brad J. Matlack  
District Manager

Kelly Smith  
Conservation Technician

Karola Dalen  
Agricultural Technician

Kirstin Swenson  
Water Resource  
Coordinator

Lu Olean  
Administrative Assistant

Sincerely;

Kelly Smith,  
Carlton SWCD

**Please review info below. If you even think you might be working near a wetland, save yourself future problems and contact Heather Cunningham at the Carlton Co. Zoning Office – 218-384-9176**

## **WETLAND CONSERVATION ACT (WCA)**

### **DEFINITION OF A WETLAND**

Essentially, it must meet three criteria to be identified as a wetland: 1) The area must have mostly hydric soils, which are soils that are inundated or saturated to the surface for more than two weeks during the growing season in most years; 2) The area must be inundated or saturated to the surface for at least 5% of the growing season (or approximately 2 weeks) in most years; 3) The prevalent vegetation in the area are plants that have adapted to the conditions stated above. These plants are known as hydrophytes. Descriptions and pictures of wetland types are in the "Wetland Information Guide," which is available at the Carlton County Zoning Office.

### **STATUTES AND RULES**

The Wetland Conservation Act was first passed in 1991 as Minnesota Laws Chapter 354, as amended (codified, as amended, as Minnesota Statutes, section 103G.222-2373 and in other scattered sections). Rules were promulgated by the Minnesota Board of Water and Soil Resources in Minnesota Rules, chapter 8420, as amended.

### **SCOPE OF THE ACT**

Draining, filling and in some cases, excavating in wetlands is prohibited unless (a) the drain, fill, or excavation activity is exempt or (b) wetlands are replaced by restoring or creating wetland areas of at least equal public value. The overall goal is no net loss of wetlands.

The local government unit (LGU) has the primary responsibility for administering WCA and for making key determinations. Generally, the LGU is the city or county. Carlton County is the LGU except in the cities of Cloquet and Wright.

WCA does not supersede other regulations such as those of the Army Corps of Engineers (ACOE) or Minnesota Department of Natural Resources (MDNR). WCA does not apply to public waters wetlands, which are regulated by the MDNR. Persons proposing to do wetland projects may need approval from these agencies. The combined application forms should be used to notify these agencies prior to commencing a project in or near wetlands.

### **EXEMPTIONS**

WCA specifies 9 categories of exempt draining and filling activities. Interested property owners can contact the Carlton County Planning and Zoning office (LGU) to find out whether the property owner qualifies for any of these exemptions.

1. Agricultural activities. A replacement plan for wetlands is not required for certain agricultural activities.
2. Drainage. For the purposes of this exemption, a public drainage system is defined as any ditch or tile lawfully connected to the drainage system.
3. Federal Approvals. A replacement plan for wetlands is not required for activities authorized under section 404 of the federal Clean Water Act or section 10 of the Rivers and Harbors Act.
4. Wetland Restoration. A replacement plan for wetlands is not required for activities in a wetland restored or created for conservation purposes under a contract or easement providing the landowner has the right to drain the restored or created wetland.
5. Incidental wetlands. A replacement plan for wetlands is not required for activities in wetland areas created solely as a result of beaver dam construction, blockage of culverts, actions by public or private entities that were taken for a purpose other than creating wetlands, or any of the above combinations.

6. Utilities; public works. A wetland replacement plan is not needed for specific types of utility placement, maintenance, repair, enhancement or replacement of utilities or utility-type work.
7. Forestry. A wetland replacement plan is not required for certain silvicultural activities.
8. De minimis. A replacement plan for wetlands is not required for draining, excavating, or filling the following amounts of wetlands as part of a project:
  - a) 10,000 square feet of a type 1, 2, 6 or 7 wetland, excluding white cedar and tamarack wetlands, outside of the shoreland wetland protection zone (1,000 feet of a lake or 300 feet of a river).
  - b) 400 square feet of type 1, 2, 6, or 7 wetland, except for white cedar and tamarack wetland, outside of the building setback, but within the shoreland wetland protection zone.
  - c) 100 square feet of type 3, 4, 5, or 8, and white cedar and tamarack wetland outside of the building setback zone.
  - d) 20 square feet of wetland, regardless of type, inside the building setback zone.The amounts listed above may not be combined on a project. A project is defined as a specific plan, contiguous activity, proposal, or design necessary to accomplish a goal as defined by the LGU. A project may not be combined into phases or components.
9. Wildlife habitat. A replacement plan for wetlands is not required for wildlife habitat improvement projects.

#### **EXEMPTION DETERMINATIONS**

A landowner intending to drain or fill a wetland without replacement can contact the Carlton County Planning and Zoning office for determination whether or not the activity is exempt. The landowner can fill out an application requesting exemption. This is the combined application referenced above.

#### **NO-LOSS DETERMINATIONS**

A landowner can apply to the LGU (Carlton County) for a no-loss determination. Requests can be made to the LGU for activities that will result in no net loss of wetlands. Typical requests for no-loss determinations include the conversion of type 1, 2, 6, or 7 wetlands into wildlife ponds that results in no net loss of wetlands. Certain criteria need to be met and interested parties should contact the Carlton County Planning and Zoning office.

#### **REPLACEMENT PLANS**

A landowner intending to drain, excavate, or fill a wetland who does not qualify for an exemption or no-loss determination needs to obtain approval of a replacement plan from the LGU before draining or filling activities. Applications can be obtained from the Carlton County Planning and Zoning office. A person who does not do so is subject to the enforcement provisions in Minnesota Statutes, section 103G.2372.

If landowners have any questions, please call me at 218-384-9178.

Thanks!  
Heather Cunningham  
Resource and Recycling Coordinator  
Carlton County

8/6/07



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## WHAT TO THINK ABOUT BEFORE SELECTING A CONTRACTOR

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- ✓ **Get bids from at least three contractors** - Although it is not a requirement, we urge you to try to get three different contractors to bid. Competition will increase the likelihood of getting the best price for the same work.
- ✓ **You can request any contractor you know to bid on the job but you will want to check their references before the contract is signed.** While you are the person selecting the contractor and signing the contract, the Township will require that all participating contractors show proof of insurance and licensing and that they have enough experience to finish the work to everyone's satisfaction.
- ✓ **Rehabilitation contractors must have appropriate licenses and adequate insurance.** As of January 1993, the State of Minnesota requires licensed contractors. We require insurance to cover property damage and injury protection while they work on your project.
- ✓ **ALSO** As of February 1, 2011, the State of Minnesota requires municipalities to verify lead certification for the residential builders, remodelers, roofers and manufactured home installers when they are requesting a permit to work on homes constructed prior to 1978.
- ✓ **Do not discriminate when asking contractors to bid.** Property owners getting Small Cities Development Programs funds cannot discriminate on the basis of race, color, creed, religion, sex, national origin, age, handicap or otherwise, as provided by applicable law in the selection of contractors to submit bids.

**ORDINANCE NO. 35**

**AN ORDINANCE AMENDING  
ORDINANCE NO. 12, ARTICLE 1**

THE TOWN OF THOMSON BOARD OF SUPERVISORS HEREBY ORDAINS:

SECTION 1 Section 1.20 of Article 1, of Town of Thomson Zoning Ordinance No. 12 is hereby amended to revise the definition "Dwelling, Single Family" to the following:

**SINGLE FAMILY DWELLING:** Any structure designed or used as the living quarters for one family which:

1. Has been connected to water, sanitation facilities and electrical supply.
2. Is constructed in conformance with Section 327.31 to 327.35 of the Minnesota Statutes.
3. Is placed and attached to a permanent full perimeter foundation meeting the requirements of the Minnesota State Building Code, provided, however, that any so called "floating slab on grade foundation" or any so called "pier and post" foundation system shall be reviewed and certified to by a Minnesota registered structural engineer competent in soil mechanics.

SECTION 2 The purpose and intent of this amendment is to promote the public health, safety, and general welfare by establishing regulations governing dwellings within the Town of Thomson that will protect property values, preserve the tax base of the community and assure a reasonable compatibility between all types of housing in the Town of Thomson.

SECTION 3 This ordinance shall take effect and be in force from and after its passage and publication.

TOWN OF THOMSON  
Marvin Bodie, Chairman

ATTEST:  
Raymond O. Maki, Clerk  
August 23, 1996

# TOWN OF THOMSON

## Application for Zoning Certification

I. Applicant: Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone Number: \_\_\_\_\_

II. Activity Proposed: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

III. Location of property which activity is to be conducted on: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

IV. Attach plat plan showing the location, dimensions and nature of any structure involved, including set backs from property lines.

V. The undersigned does hereby make application for a Zoning Certificate for the activity described herein. The undersigned has received and/or has reviewed in the Town office a copy of the Town of Thomson's Zoning Ordinance. The Town of Thomson relies on the undersigned's representations and does not waive the enforceability of the Zoning Ordinance in the event that errors, omissions or otherwise result in a non-conforming structure, use or activity. The undersigned shall be liable and responsible for all costs and expenses necessary for the proposed activity in final or completed stage to comply with the Zoning Ordinance, including but not limited to costs of dismantling and/or relocating structures in some instances.

The undersigned is aware of the right and opportunity to employ licensed professionals such as registered surveyors, registered architects and/or contractors, to ensure the proposed activity complies with the Zoning Ordinance.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_

\_\_\_\_\_  
Applicant Signature

# Residential Site Plans – Sample Site Plan & Items Required

Note: See Page 2 for items required to be shown on the Site Plan

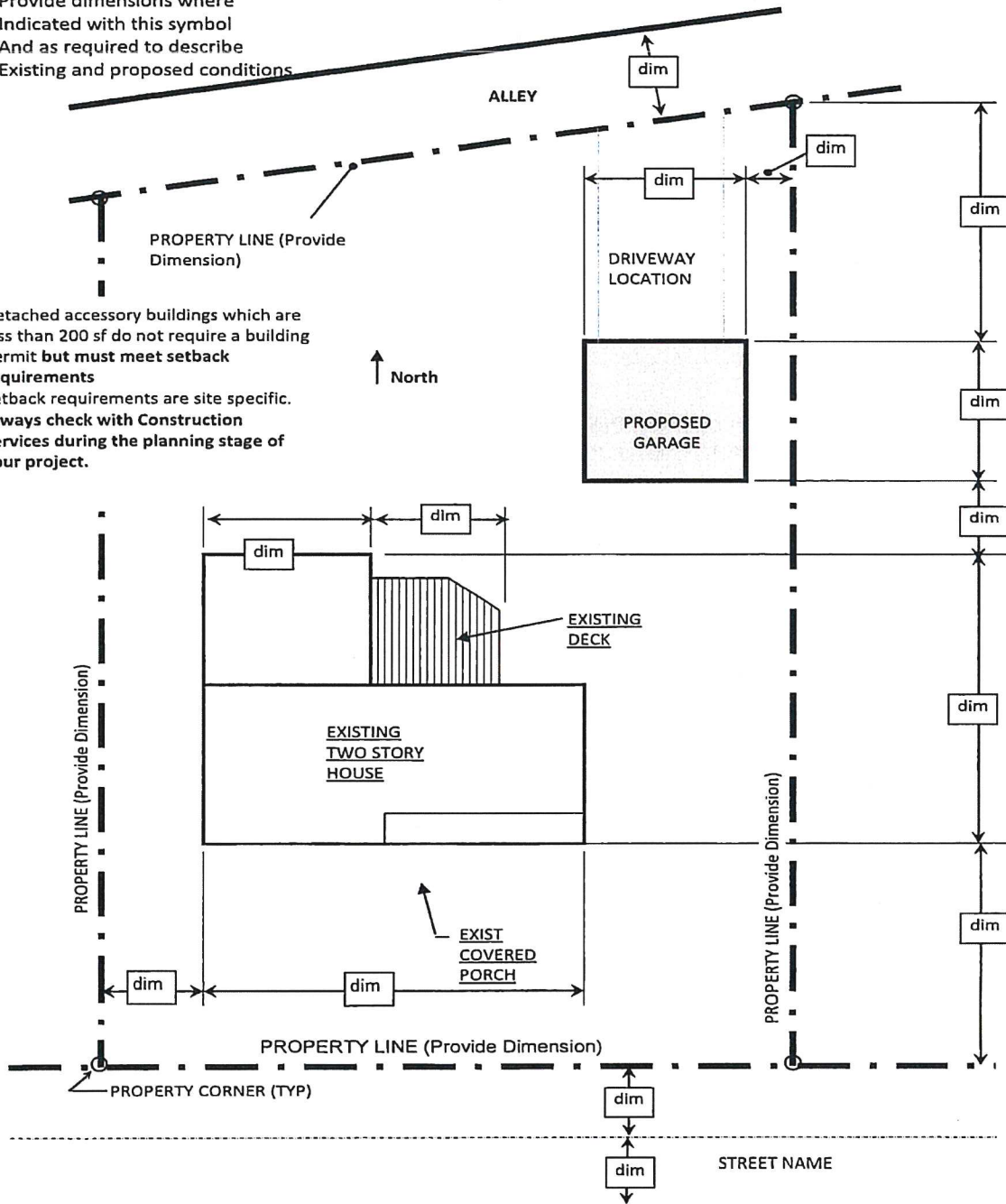
## Sample Site Plan

Don't use this sheet-create your own drawing.

SCALE: 1" = \_\_\_\_\_ FEET

dim Provide dimensions where indicated with this symbol And as required to describe Existing and proposed conditions

- Detached accessory buildings which are less than 200 sf do not require a building permit but must meet setback requirements
- Setback requirements are site specific.
- Always check with Construction Services during the planning stage of your project.



## Site Plan Instructions

Provide two copies

If the footprint of the building will not be changed, the site plan must be drawn to scale and must include the following:

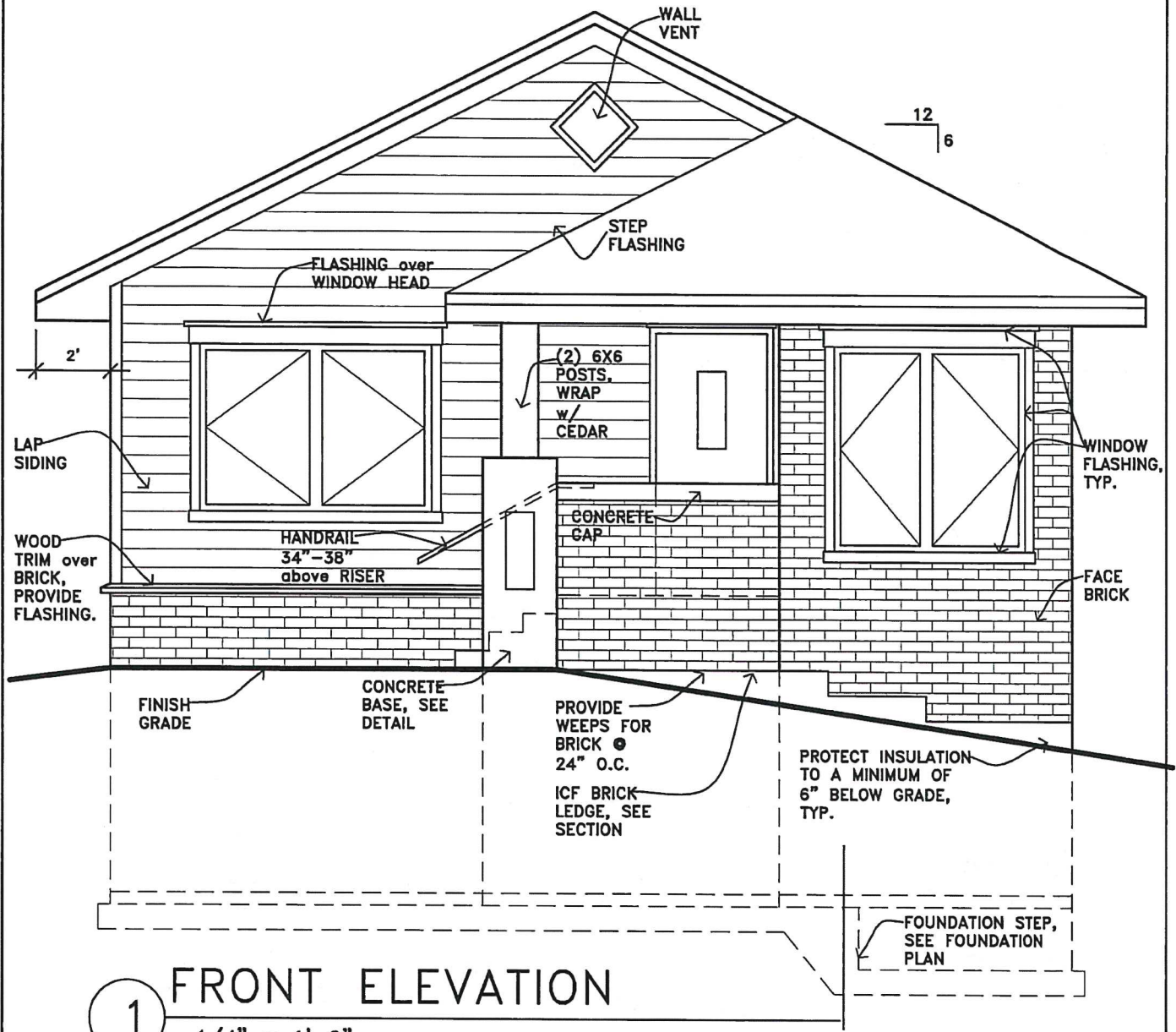
- Dimensions of lot. Property lines must be consistent with the legal description of the property.
- All buildings existing on the lot, their exterior dimensions, distances to property lines.
- Include all projections and any accessory structures (decks, garages, sheds, etc.).
- The legal description of the property.
- Scale.
- North arrow.

If the footprint of the building will be changed, in addition to the above:

- Dimensions of lot and survey monuments on which the site plan is based (example: found property corner pins placed according to a recorded survey or plat).
- Complete exterior dimensions of all proposed structures, projections and additions and dimensions to all property lines.
- Adjacent streets or alleys with right-of-way widths shown, if known.
- Any known easements on the property (existing utility or access) with dimensions.
- Existing and proposed drainage patterns.
- Setback distances (front, rear and side) required by applicable codes.
- Indicate the location of any utilities in the vicinity of the proposed work.
- Attach all prior Planning Commission or Council approvals.

Other information may be required for certain sites and will be requested during the plan review process.

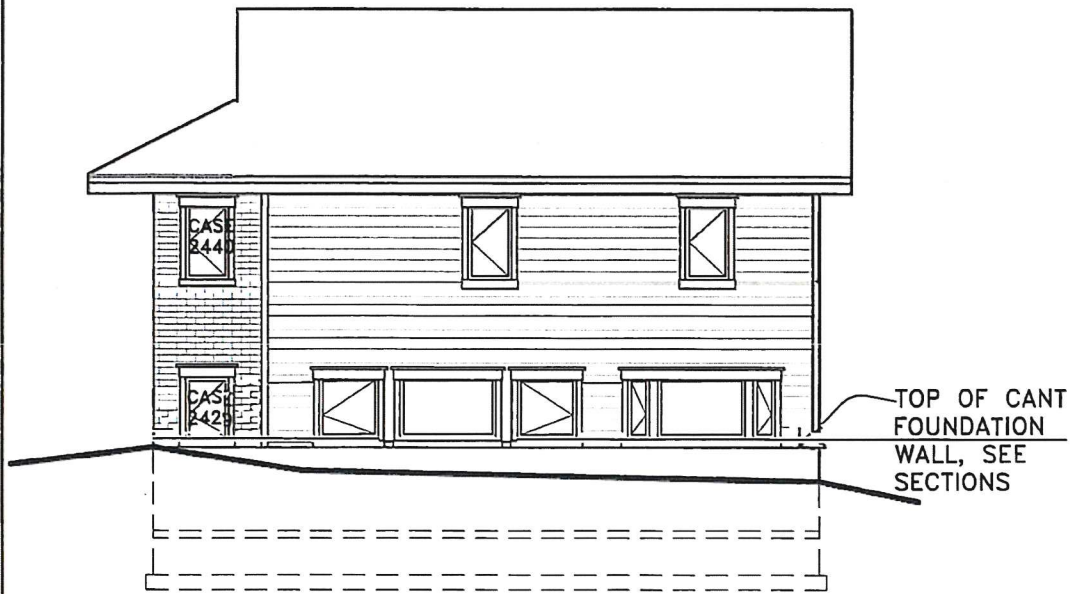




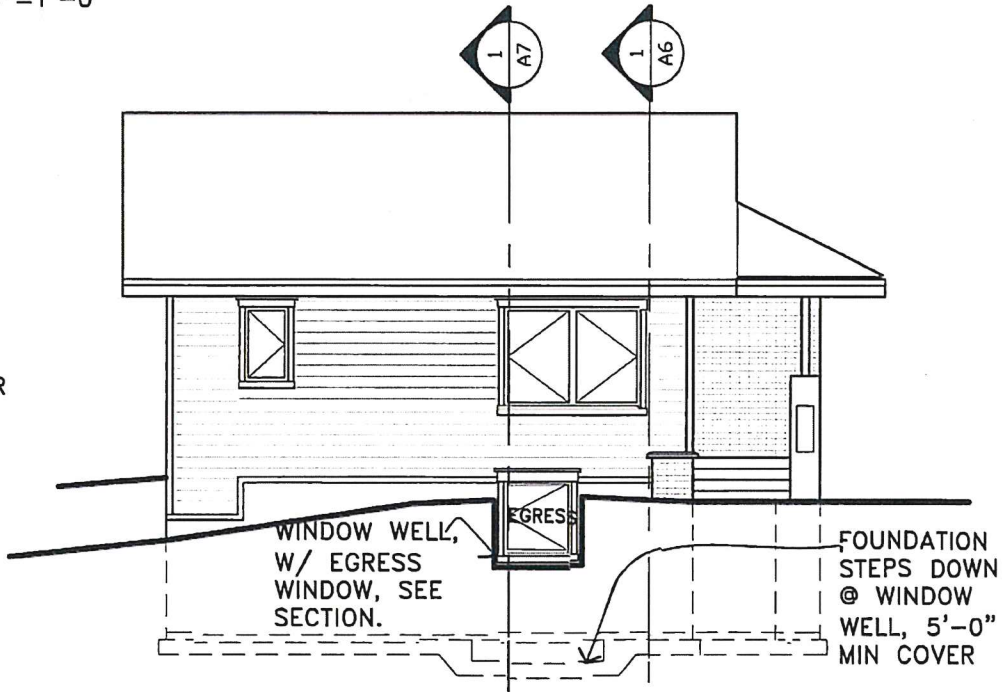
1 FRONT ELEVATION  
 1/4" = 1'-0"

SAMPLE  
 RESIDENTIAL ELEVATION  
 EXAMPLE NOT FOR CONSTRUCTION

:	BUILDING ELEVATION
:	
:	
:	



1 EAST ELEVATION  
1/8"=1'-0"



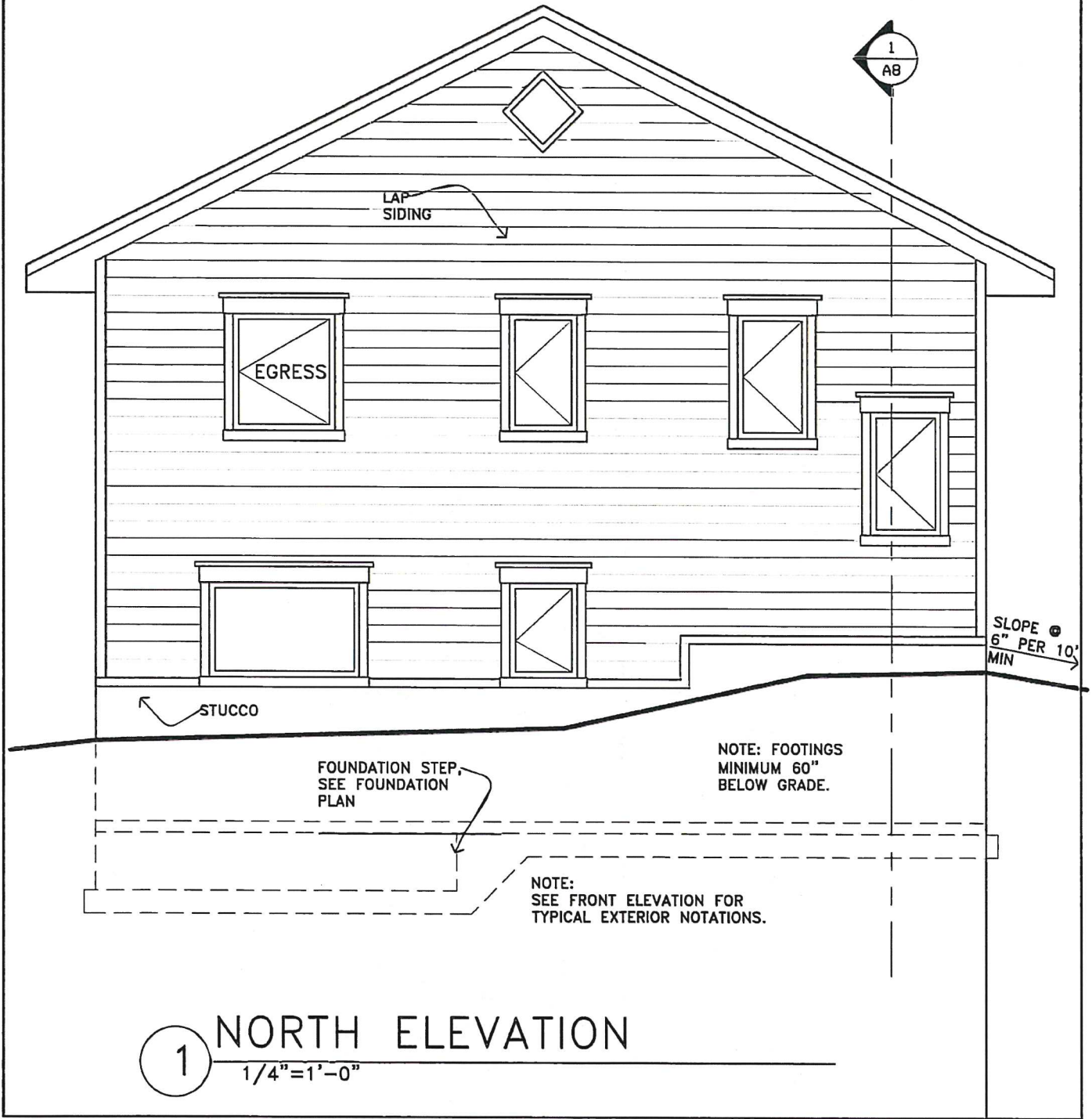
NOTE:  
SEE FRONT  
ELEVATION FOR  
TYPICAL  
EXTERIOR  
NOTATIONS.

2 WEST ELEVATION  
1/8"=1'-0"

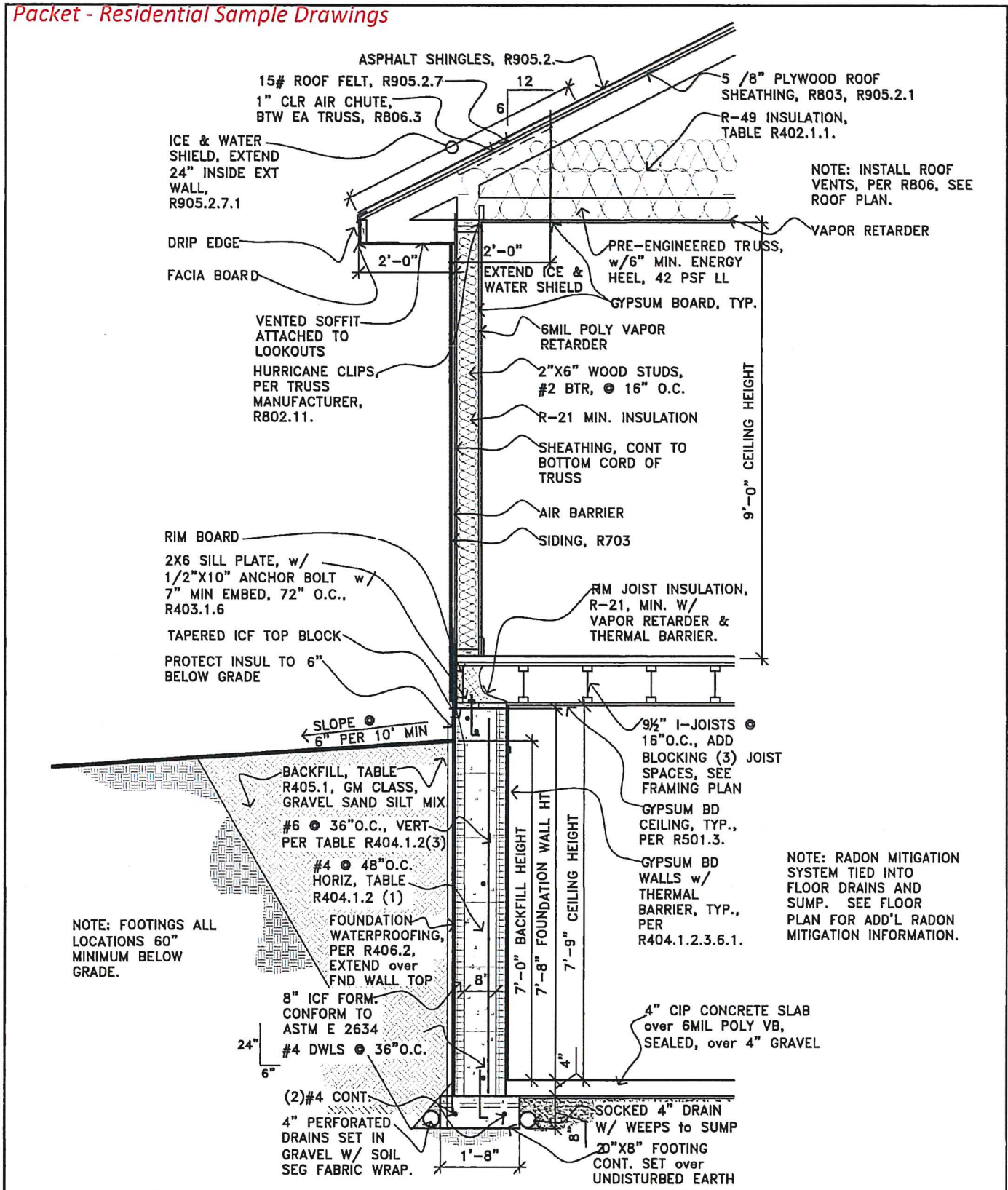
SAMPLE  
RESIDENTIAL ELEVATION  
EXAMPLE NOT FOR CONSTRUCTION

2
SAMPLE ELEVATIONS





SAMPLE  
RESIDENTIAL ELEVATION  
EXAMPLE NOT FOR CONSTRUCTION

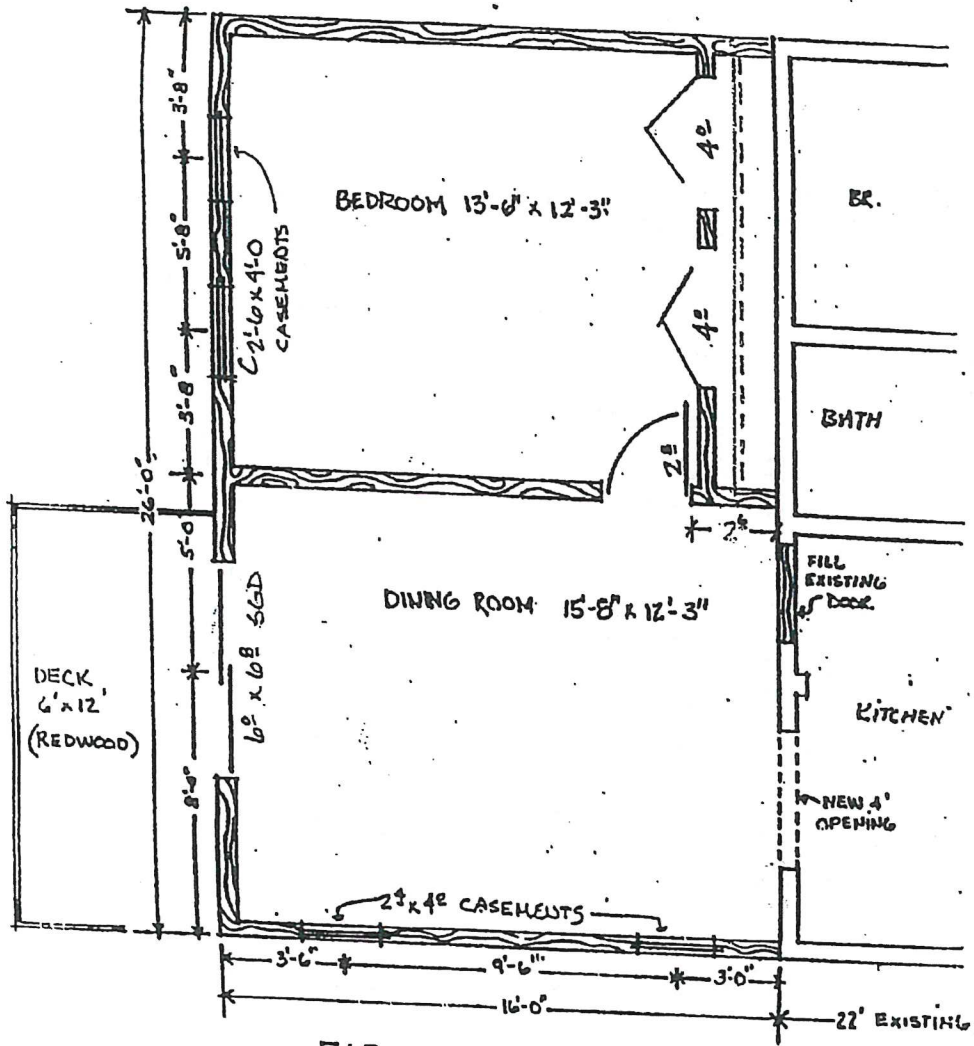



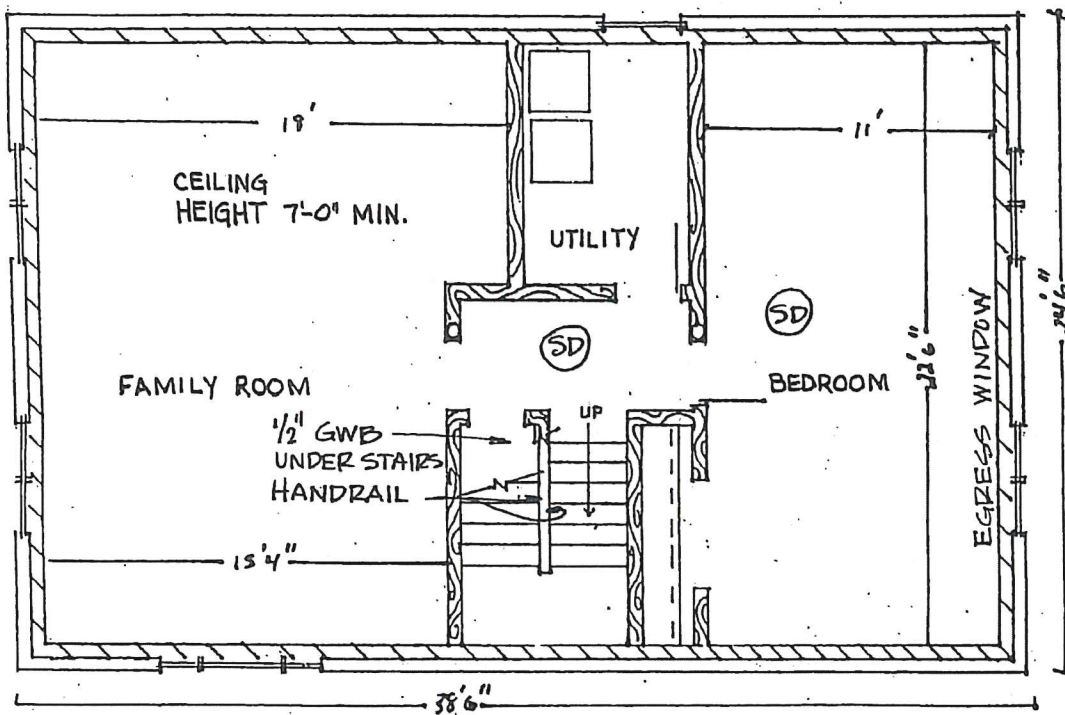
# EXAMPLE WALL SECTION

## RESIDENTIAL BUILDING CODE

SCALE: 3/8"=1'-0"

_____	HANDOUTS
_____	
_____	
_____	





SAMPLE BASEMENT PLAN SCALE: 3/16" = 1'-0"

ROOF COVERING (TYPE)

ROOFING FELT (TYPE)

ICE/WATER SHIELD<sup>1</sup>

SHEATHING (TYPE)

TRUSSES @ (SPACING) o.c.<sup>2</sup>  
OR (NOMINAL SIZE OF)  
RAFTERS @ (SPACING) o.c.<sup>2</sup>

RIGID WIND WASH BARRIER (REQ'D)  
TO BOTTOM OF TOP CHORD

(TYPE OF) CEILING INSULATION

(R-VALUE OF) CEILING INSULATION

FASCIA TYPE

SOFFIT (TYPE)

SOFFIT VENTING (TYPE)

ATTIC VENTING (TYPE)

SIDING (TYPE)

SHEATHING MATERIAL

WEATHER RESISTIVE SHEATHING PAPER (TYPE)

(NOMINAL SIZE OF) STUDS @ (SPACING) o.c.

(R-VALUE OF) WALL INSULATION

VAPOR BARRIER (TYPE)

(NOMINAL SIZE OF) SILL PLATE

RIM JOIST (SIZE AND TYPE)

(TYPE AND R-VALUE OF) RIM JOIST INSULATION (REQ'D)  
AND VAPOR BARRIER

(SIZE OF) ANCHOR BOLTS @ (SPACING) o.c.  
Embedded minimum 7"

(R-VALUE AND TYPE) FOUNDATION INSULATION<sup>3</sup>

EXTERIOR INSUL. PROTECTION ABOVE GRADE  
AND TO 6" BELOW GRADE (REQ'D)

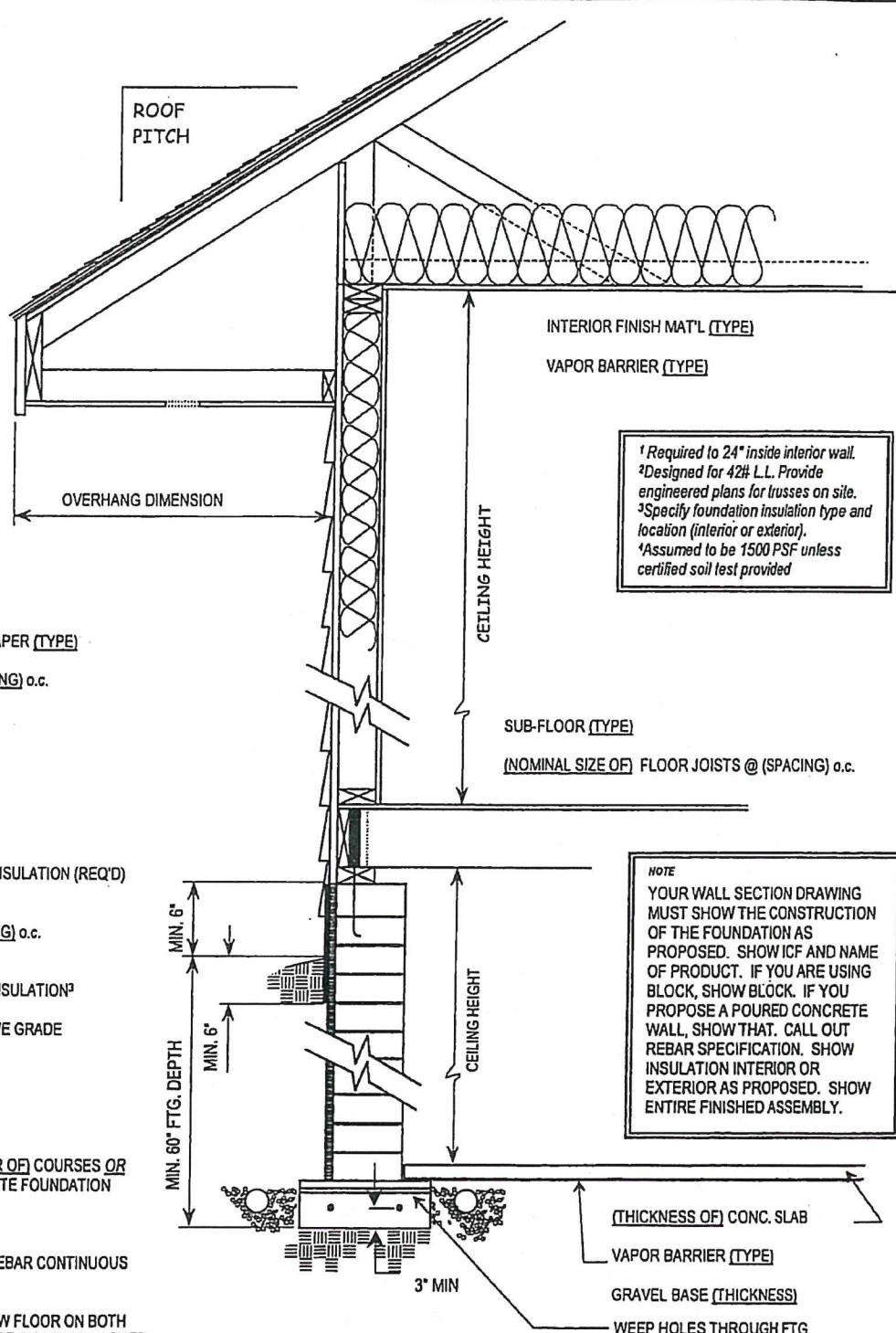
FOUNDATION WATERPROOFING  
PRODUCT (PROVIDE SPECIFICATION)

(SIZE) CONC. BLOCK FOUNDATION  
W/ (SIZE) REBAR (SPACING), (NUMBER OF) COURSES OR  
(WALL THICKNESS) POURED CONCRETE FOUNDATION  
W/ (SIZE) REBAR (SPACING)

(SIZE) POURED CONCRETE FOOTING  
ON UNDISTURBED EARTH W/ (SIZE) REBAR CONTINUOUS  
LOCATED IN BOTTOM 1/3.

FOUNDATION DRAINAGE REQ'D BELOW FLOOR ON BOTH  
SIDES OF FOOTING. PERFORATED PIPE ON MIN 2" WASHED  
GRAVEL OR CRUSHED ROCK LARGER THAN PIPE  
OPENINGS & COVERED W/ 6" OF SAME MATERIAL.  
DISCHARGE TO DAYLIGHT OR SUMP. INSTALL WEEPERS  
THROUGH UPPER 1/3 OF FOOTING TO ALLOW FLOW TO  
INTERIOR DRAIN. (SUMP OR DAYLIGHT, NOT SEWER)

SOIL BEARING CAPACITY<sup>4</sup> (LBS PER SQ. FT.)



<sup>1</sup> Required to 24" inside interior wall.  
<sup>2</sup> Designed for 42# L.L. Provide  
 engineered plans for trusses on site.  
<sup>3</sup> Specify foundation insulation type and  
 location (interior or exterior).  
<sup>4</sup> Assumed to be 1500 PSF unless  
 certified soil test provided

**NOTE**  
 YOUR WALL SECTION DRAWING  
 MUST SHOW THE CONSTRUCTION  
 OF THE FOUNDATION AS  
 PROPOSED. SHOW ICF AND NAME  
 OF PRODUCT. IF YOU ARE USING  
 BLOCK, SHOW BLOCK. IF YOU  
 PROPOSE A POURED CONCRETE  
 WALL, SHOW THAT. CALL OUT  
 REBAR SPECIFICATION. SHOW  
 INSULATION INTERIOR OR  
 EXTERIOR AS PROPOSED. SHOW  
 ENTIRE FINISHED ASSEMBLY.

## Foundation Wall Insulation Requirements: R-10, (R-5 with exceptions)

### Exterior: *(includes perimeter of slabs-on-grade)*

- Damp-proof or waterproof from top of footing to finished grade when in group 1 soils.
- Waterproof from top of footing to finished grade when in other than group 1 soils.
- Shall be a water-resistant material designed and installed for its intended use.
- Protect insulation with rigid, weather-resistant cover extending six inches below grade.
- Flash insulation top to maintain exterior wall drainage plane.
- Interior air barrier, vapor retarder materials and block core drainage holes are - **not required**.

### Interior - General Requirements: *(applies to all insulation types)*

- Masonry block cores shall be drained to interior drainage system.
- Waterproof interior if wood frame wall touches foundation wall or if using fiberglass batt insulation.
- Sealed air barrier required on interior side of insulation.

### Interior - Specific Requirements:

#### Rigid Insulation:

- Drain masonry block cores to interior drainage system.
- Must be in contact with foundation wall surface.
- Seal at top, bottom, vertical edges and joints.
- Must not be penetrated.
- Exterior above grade portion of foundation wall requires water-repellant, waterproofing or damp-proofing material or the entire inside surface of wall shall be damp-proofed or waterproofed.

#### Spray foam Insulation:

- Drain masonry block cores to interior drainage system.
- Must be in contact with foundation wall surface.
- Seal all through penetrations.
- No utility penetrations.
- Provide one-inch minimum gap between foundation walls and framing.

#### Semi-rigid Insulation:

- Drain masonry block cores to interior drainage system.
- Must be in contact with foundation wall surface.
- Seal all edges, joints and penetrations.
- Seal top edge to foundation wall and bottom edge to floor.
- Maximum perm rating of 1.1 per inch and maximum density of 1.3pcf with fungal resistance.

#### Unfaced fiberglass batt Insulation:

- Drain masonry block cores to interior drainage system.
- Waterproof inside of foundation wall surface.
- Air seal top and bottom plates to foundation wall surface and floor.
- Seal air barrier on interior side of framing and around all penetrations.

**Note:** Sealing interior rigid or semi-rigid insulations require a continuous seal with acoustic sealant. Unfaced fiberglass batt insulation may have its interior air barrier sealed by other adhesives or compatible sealing tape.

## Residential Radon Mitigation for New Construction

It's not as difficult as it may seem.

Here's the problem:

Radon occurs naturally in the rocks and soil. It is a radioactive gas, posing health risks to people and pets. If we do nothing to vent radon gases, it will accumulate in the homes where we live and breathe.

Radon gases can easily be vented and prevented from entering our homes by simply following the requirements of the 2009 *Minnesota Residential Energy Code*, chapter 1322.

Radon control is required in new one and two family dwellings and townhomes only, not required for additions or remodeling projects. Additions and remodels do not require radon control.

The following are excerpts from the 2009 *Minnesota State Residential Energy Code*, chapter 1322:

**AF103.1 General.** The following passive construction techniques are intended to resist radon entry and prepare the building for post construction active radon mitigation. (see Figure AF102).

**AF103.2 Subfloor preparation.** A layer of gas-permeable material shall be placed under all concrete slabs and other floor systems that directly contact the ground and are within the walls of the living spaces and conditioned crawl spaces of the building, to facilitate the installation of an active sub-slab depressurization system if needed. The gas-permeable layer shall consist of one of the following:

1. A uniform layer of clean aggregate, a minimum of 4 inches thick. The aggregate shall consist of material that will pass through a 2-inch sieve and be retained by a 1/4-inch sieve.
2. A uniform layer of sand (native or fill), a minimum of 4 inches thick, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.
3. Other materials, systems, or floor designs with demonstrated capability to permit depressurization across the entire sub-floor area.

**AF103.3 Soil-gas-retarder.** A minimum of 6-mil (or 3-mil cross-laminated) polyethylene or equivalent flexible sheeting material shall be placed on top of the gas-permeable layer prior to casting the slab or placing the floor assembly to serve as a soil-gas-retarder by bridging any cracks that develop in the slab or floor assembly and to prevent concrete from entering the void spaces in the aggregate base material. The sheeting shall cover the entire floor area with separate sections of sheeting lapped at least 12 inches. The sheeting shall fit closely around any pipe, wire, or other penetrations of the material. All punctures or tears in the material shall be sealed or covered with additional sheeting.

**AF103.4 Entry routes.** Potential radon entry routes shall be closed in accordance with Sections AF103.4.1 through AF103.4.10.

**AF103.4.1 Floor openings.** Openings around bathtubs, showers, water closets, pipes, wires, or other objects that penetrate concrete slabs or other floor assemblies shall be filled with a polyurethane caulk or equivalent sealant applied in accordance with the manufacturer's recommendations.

**AF103.4.2 Concrete joints.** All control joints, isolation joints, construction joints, and any other joints in concrete slabs or between slabs and foundation walls shall be sealed with a caulk or sealant. Gaps and joints shall be cleared of loose material and filled with polyurethane caulk or other elastomeric sealant applied in accordance with the manufacturer's recommendations.

**AF103.4.3 Condensate drains.** Condensate drains shall be trapped or routed through nonperforated pipe to daylight.

**AF103.4.4 Sumps.** Sump pits open to soil or serving as the termination point for sub-slab or interior drain tile loops shall be covered with a gasketed or otherwise sealed lid. Sumps used as the suction point in a sub-slab depressurization system shall have a lid designed to accommodate the vent pipe. Sumps used as a floor drain shall have a lid equipped with a trapped inlet.

**AF103.4.5 Foundation walls.** Hollow block masonry foundation walls shall be constructed with either a continuous course of solid masonry, one course of masonry grouted solid, or a solid concrete beam at or above finished ground surface to prevent passage of air from the interior of the wall into the living space. Where a brick veneer or other masonry ledge is installed, the course immediately below that ledge shall be sealed. Joints, cracks, or other openings around all penetrations of both exterior and interior surfaces of masonry block or wood foundation walls below the ground surface shall be filled with polyurethane caulk or equivalent sealant. Penetrations of concrete walls shall be filled.

**AF103.4.6 Waterproofing/dampproofing.** The exterior surfaces of portions of concrete and masonry block walls below the ground surface shall be dampproofed or waterproofed in accordance with Section R406 of this code.

**AF103.4.7 Air-handling units.** Air-handling units in crawl spaces shall be sealed to prevent air from being drawn into the unit.

**Exception:** Units with gasketed seams or units that are otherwise sealed by the manufacturer to prevent leakage.

**AF103.4.8 Ducts.** Ductwork passing through or beneath a slab shall be of seamless material unless the air-handling system is designed to maintain continuous positive pressure within such ducting. Joints in such ductwork shall be sealed to prevent air leakage.

Ductwork located in crawl spaces shall have all seams and joints sealed by closure systems in accordance with Minnesota Rules, chapter 1346.

**AF103.4.9 Unconditioned crawl space floors.** Openings around all penetrations through floors above unconditioned crawl spaces shall be caulked or otherwise filled to prevent air leakage.

**AF103.4.10 Unconditioned crawl space access.** Access doors and other openings or penetrations between basements and adjoining unconditioned crawl spaces shall be closed, gasketed, or otherwise filled to prevent air leakage.

**AF103.5 Passive sub-membrane depressurization system.** In buildings with crawl space foundations, the following components of a passive sub-membrane depressurization system shall be installed during construction.

**AF103.5.1 Ventilation.** Unconditioned crawl spaces shall be provided with vents to the exterior of the building. The minimum net area of ventilation openings shall comply with Section R408.1 of this code.

**AF103.5.2 Soil-gas-retarder.** The soil in crawl spaces shall be covered with a continuous layer of minimum 6-mil polyethylene soil-gas-retarder. The ground cover shall be lapped a minimum of 12 inches at joints and shall extend to all foundation walls enclosing the crawl space area.

**AF103.5.3 Vent pipe.** A plumbing tee or other approved connection shall be inserted horizontally beneath the sheeting with one 10-foot section of a perforated pipe connected to each side of the "T" fitting and then connected to a 3- or 4-inch diameter fitting with a vertical vent pipe installed through the sheeting. The vent pipe shall be of solid piping material and shall be extended up through the building floors, terminated at least 12 inches above the roof in a location at least 10 feet away from any window or



other opening into the conditioned spaces of the building that is less than 2 feet below the exhaust point, and 10 feet from any window or other opening in adjoining or adjacent buildings.

**AF103.6 Passive sub-slab depressurization system.** In buildings with basements, foundations, and/or conditioned crawl spaces, or slab-on-grade buildings, the following components of a passive sub-slab depressurization system shall be installed during construction.

**AF103.6.1 Vent pipe.** A minimum 3-inch diameter ABS, PVC, or equivalent gastight pipe shall be embedded vertically into the sub-slab aggregate or other permeable material before the slab is cast. A "T" fitting with one 10-foot section of a perforated pipe connected to each side of the "T" fitting or equivalent method shall be used to ensure that the pipe opening remains within the sub-slab permeable material. Alternatively, the 3-inch pipe shall be inserted directly into an interior perimeter drain tile loop or through a sealed sump cover where the sump is exposed to the sub-slab aggregate or connected to it through a drainage system.

The pipe shall be extended up through the building floors, terminate at least 12 inches above the surface of the roof in a location at least 10 feet away from any window or other opening into the conditioned spaces of the building that is less than 2 feet below the exhaust point, and 10 feet from any window or other opening in adjoining or adjacent buildings.

**Exception:** If an active sub-slab depressurization system is installed, the vent pipe may be routed through unconditioned space within the building or garage, provided the vent pipe is insulated to a minimum of R-4. Radon vent pipes shall terminate at least 12 inches above the roof or shall be connected to a single vent that terminates at least 12 inches above the roof. For active systems, a system monitoring device must also be installed. All other requirements of this section apply.

**AF103.6.2 Multiple vent pipes.** In buildings where interior footings or other barriers separate the sub-slab aggregate or other gas-permeable material, each area shall be fitted with an individual vent pipe. Radon vent pipes shall connect to a single vent that terminates at least 12 inches above the roof or each individual vent pipe shall terminate separately at least 12 inches above the roof.

**AF103.7 Vent pipe drainage.** All components of the radon vent pipe system shall be installed to provide positive drainage to the ground beneath the slab or soil-gas-retarder.

**AF103.8 Vent pipe accessibility.** Radon vent pipes shall provide enough space around the pipe for future installation of a fan system. The space provided for installation of a future fan shall be a minimum of 24 inches in diameter, centered on the axis of the vent stack, and shall extend for a minimum vertical distance of 3 feet.

**Exception:** The radon vent pipe need not be accessible in an attic space where an approved rooftop electrical supply is provided for future use.

**AF103.9 Vent pipe identification.** All radon vent pipes shall be identified with at least one label on each floor and in accessible attics. The label shall read: "Radon Reduction System."

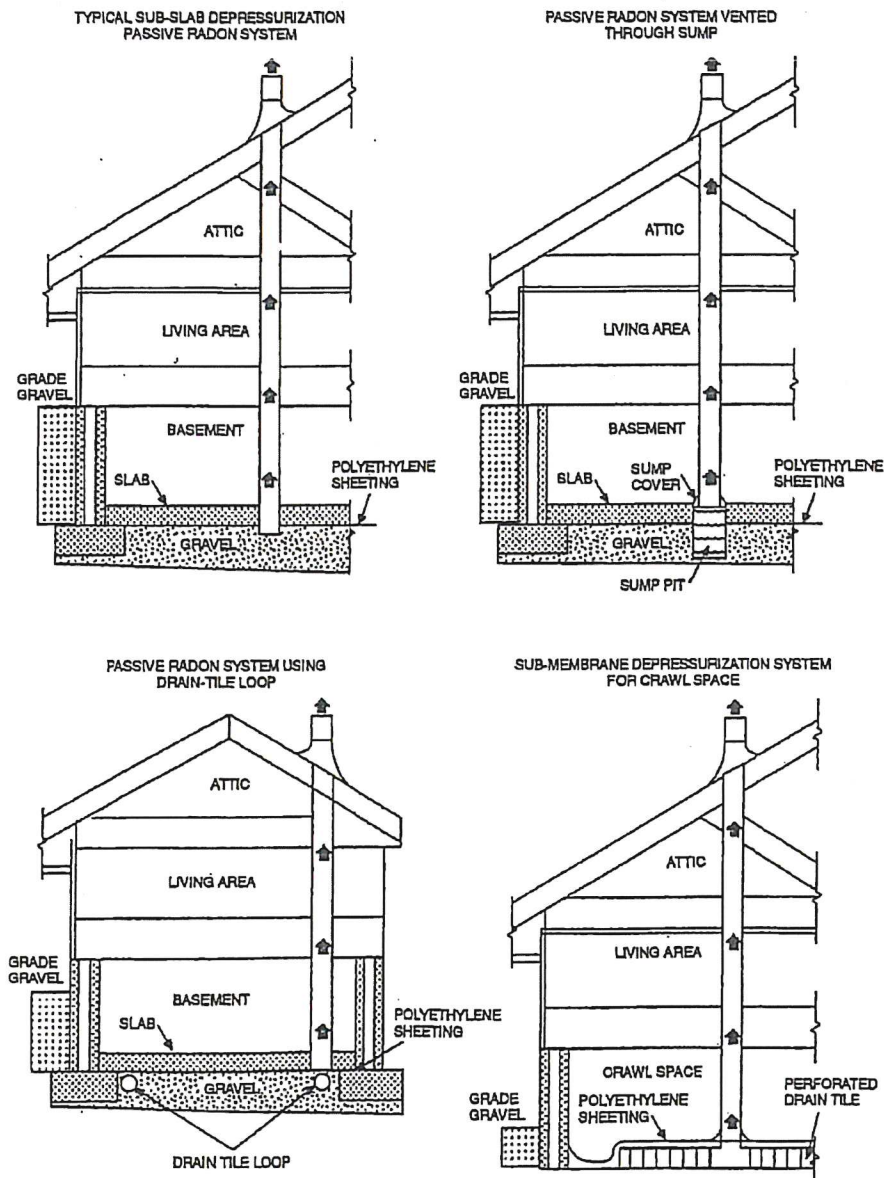
**AF103.10 Combination foundations.** Combination basement/crawl space or slab-on-grade/crawl space foundations shall have separate radon vent pipes installed in each type of foundation area. Each radon vent pipe shall terminate above the roof or shall be connected to a single vent that terminates above the roof.

**Exception:** A single vent pipe is allowed in a building with a combination foundation as long as soil gases can flow freely between the areas of the combination foundations and it is connected to an approved vent pipe.

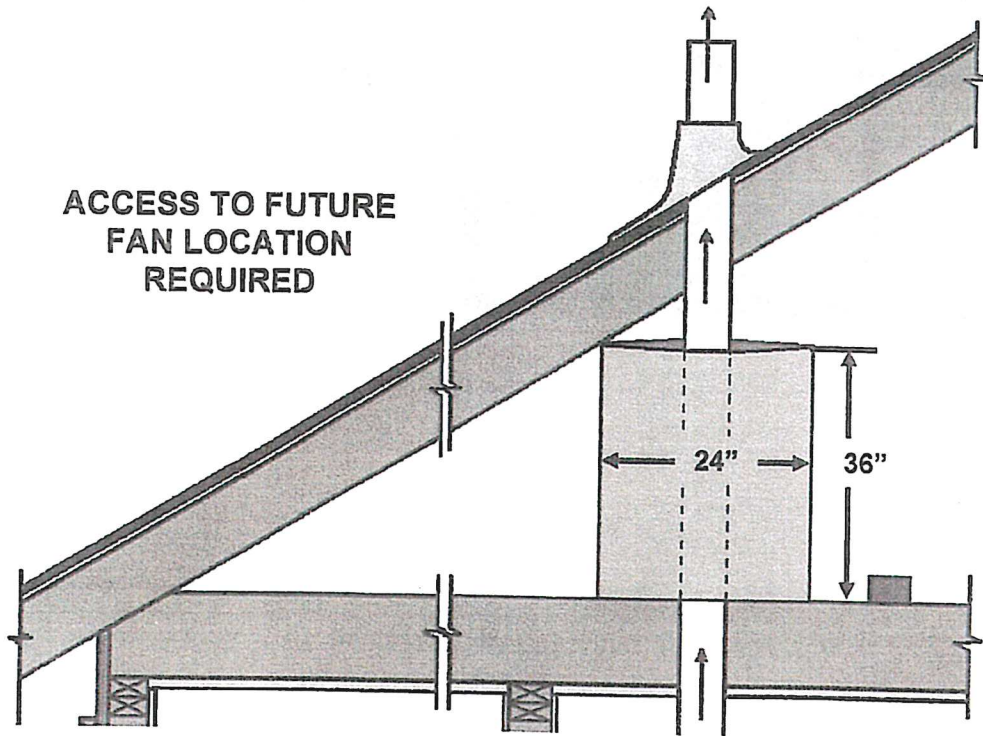
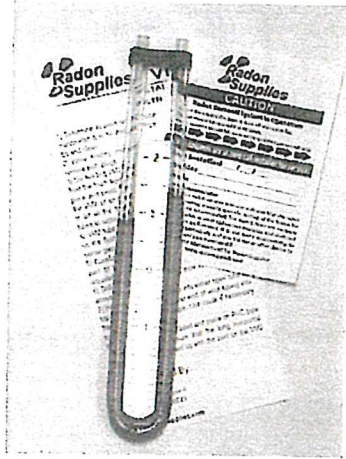
**AF103.11 Building depressurization.** Joints in air ducts and plenums in unconditioned spaces shall meet the requirements of Minnesota Rules, chapter 1346. Thermal envelope air infiltration requirements shall comply with the energy conservation provisions in chapter 1322. Firestopping shall meet the requirements contained in Section R602.8.

**AF103.12 Power source.** To provide for future installation of an active sub-membrane or sub-slab depressurization system, an electrical circuit terminated in an approved box shall be installed during construction in the attic or other anticipated location of vent pipe fans.

For further information regarding radon gases, the US Environmental Protection Agency has issued "A Citizen's Guide to Radon" located at: <http://www.epa.gov/radon/pubs/citguide.html>

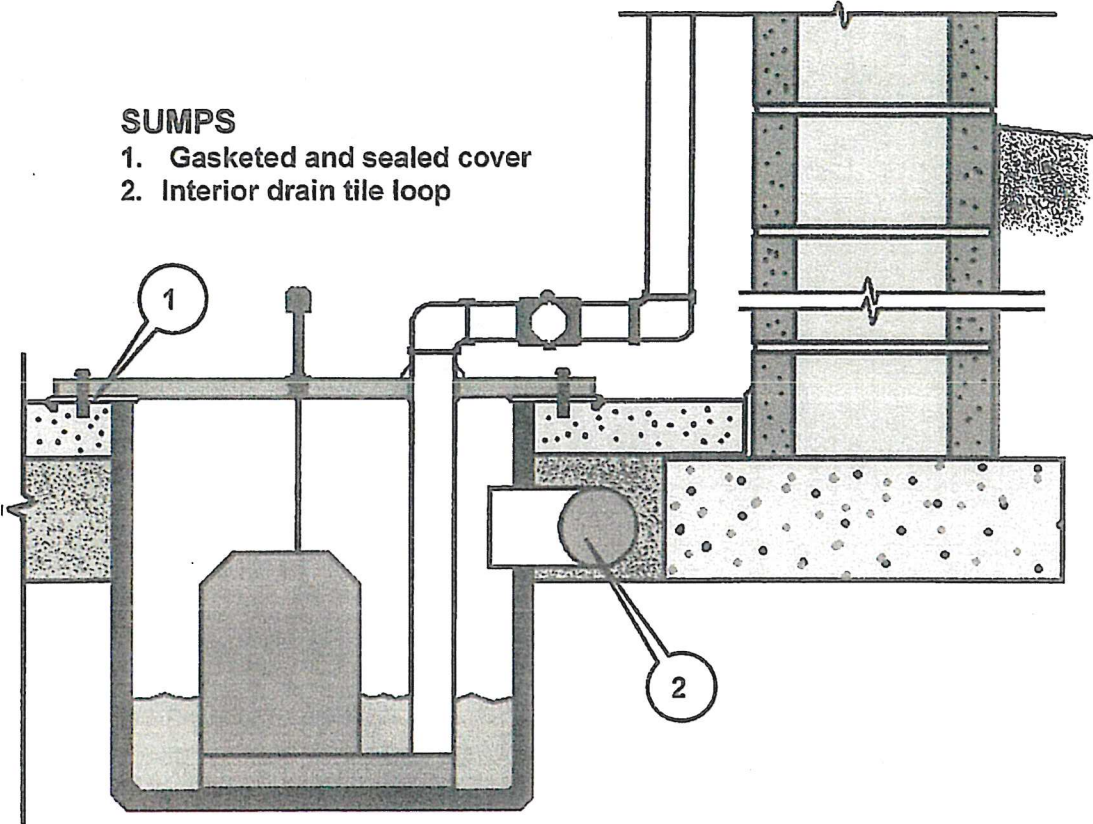


**FIGURE AF102**  
**RADON-RESISTANT CONSTRUCTION DETAILS FOR FOUR FOUNDATION TYPES**



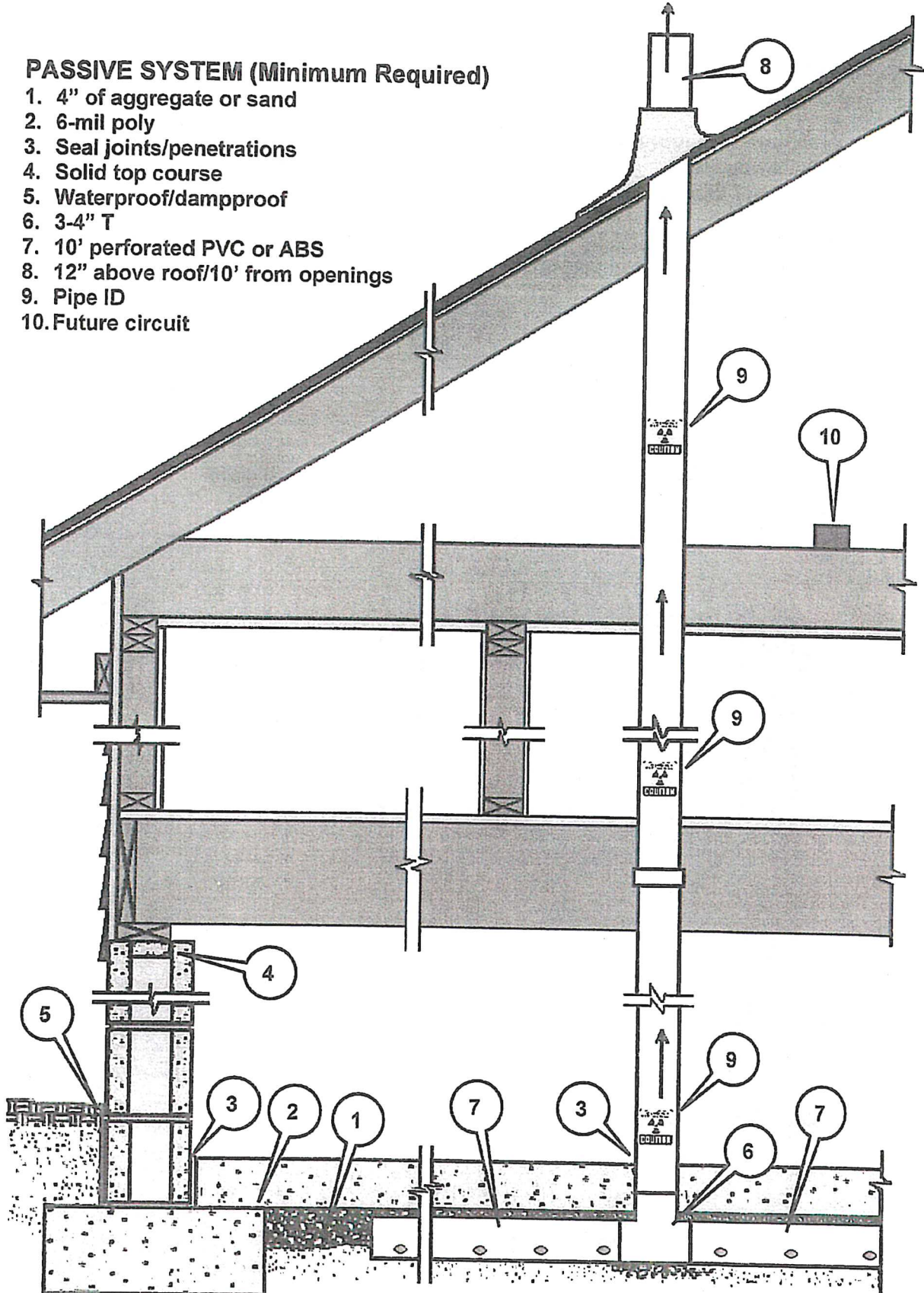
**SUMPS**

- 1. Gasketed and sealed cover
- 2. Interior drain tile loop

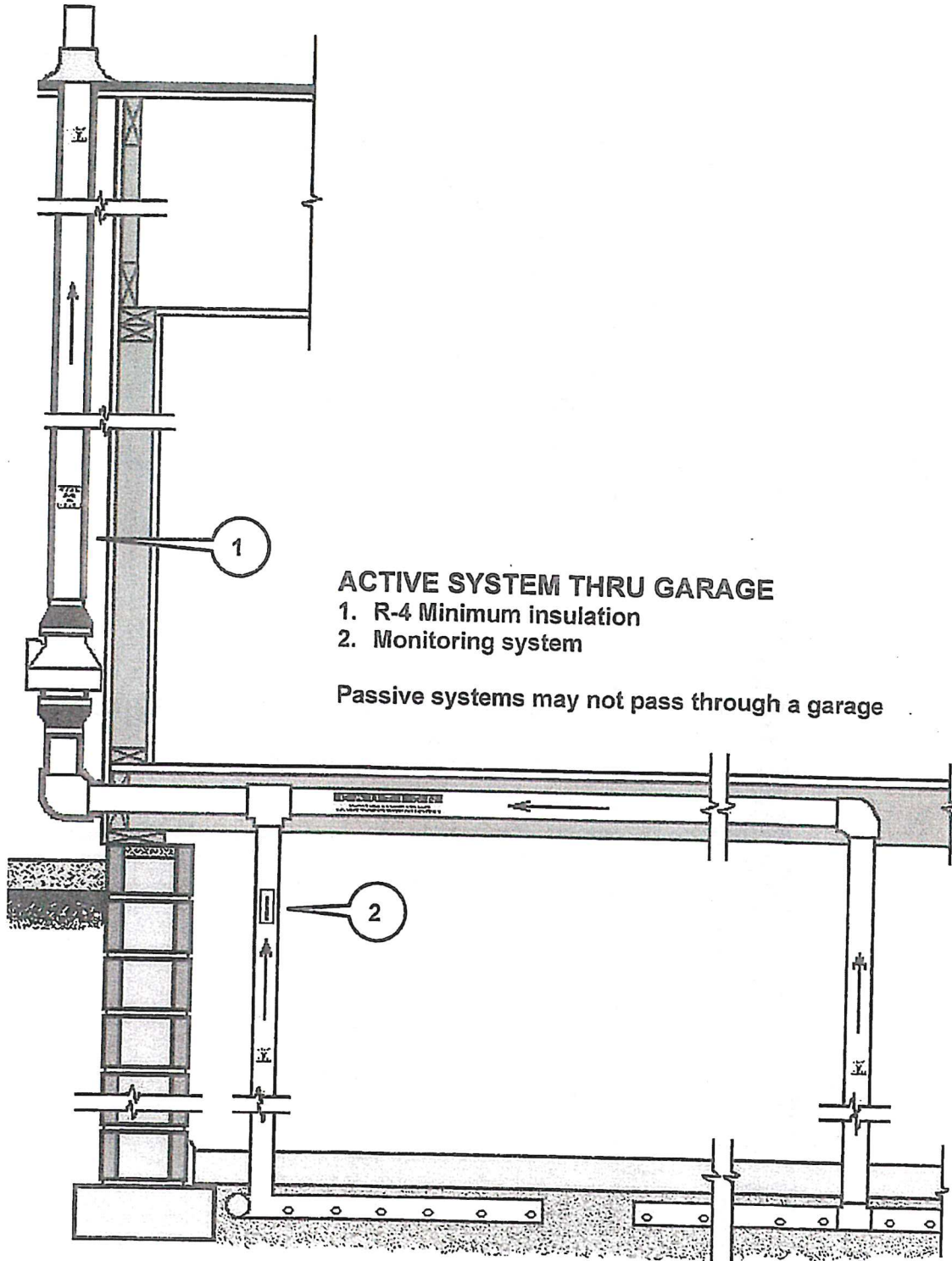


**PASSIVE SYSTEM (Minimum Required)**

1. 4" of aggregate or sand
2. 6-mil poly
3. Seal joints/penetrations
4. Solid top course
5. Waterproof/dampproof
6. 3-4" T
7. 10' perforated PVC or ABS
8. 12" above roof/10' from openings
9. Pipe ID
10. Future circuit



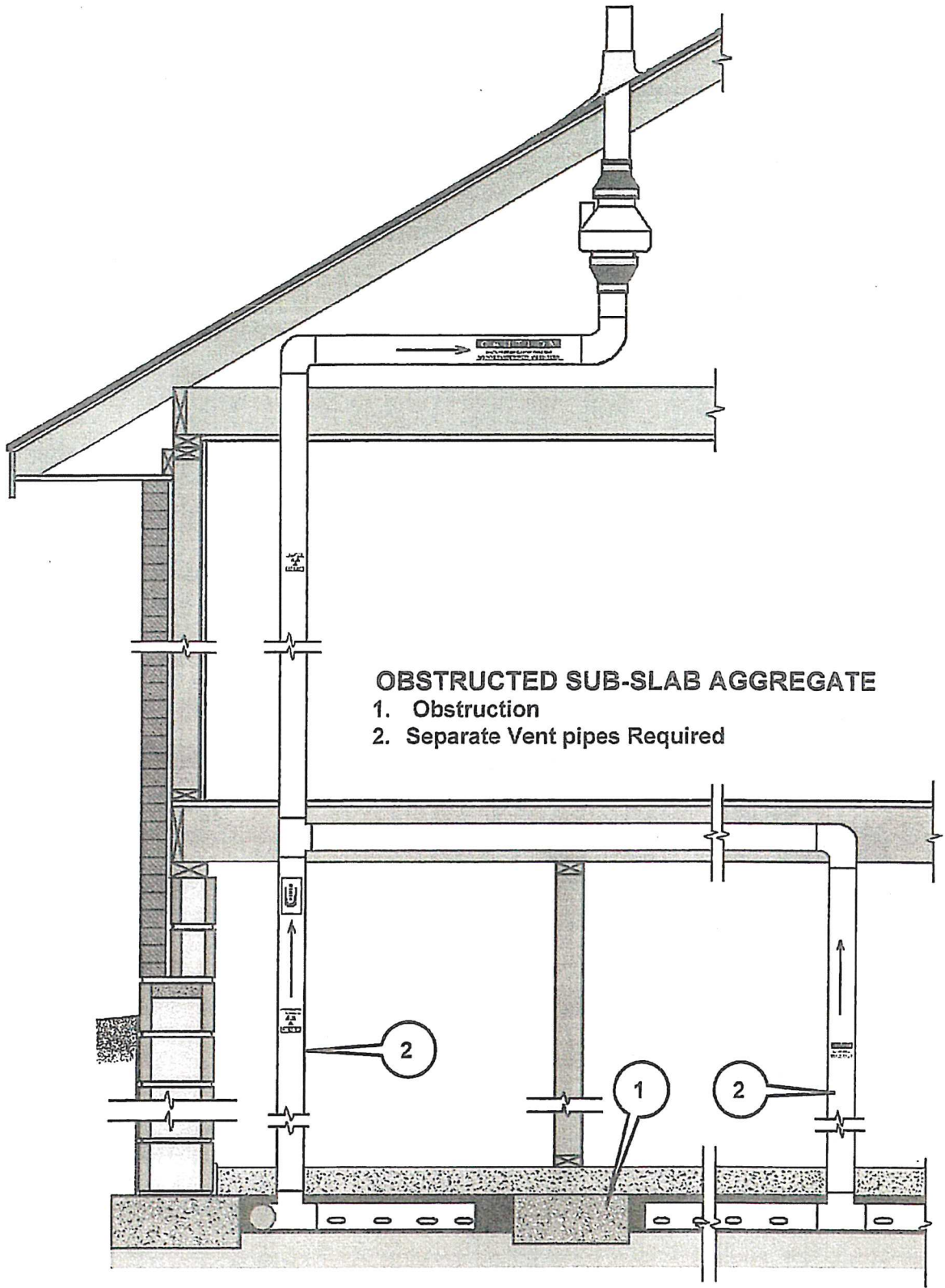




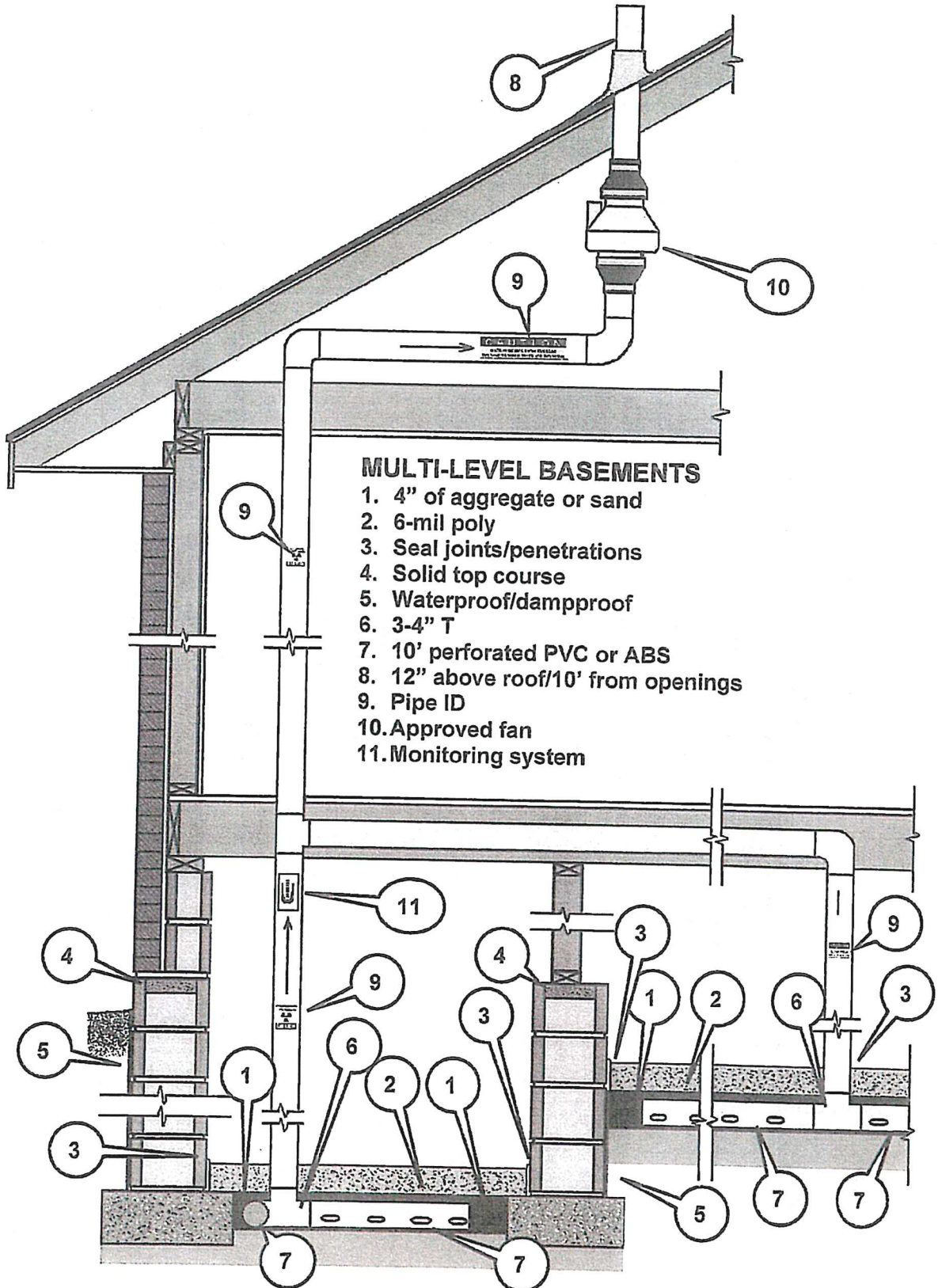
**ACTIVE SYSTEM THRU GARAGE**

- 1. R-4 Minimum insulation
- 2. Monitoring system

Passive systems may not pass through a garage







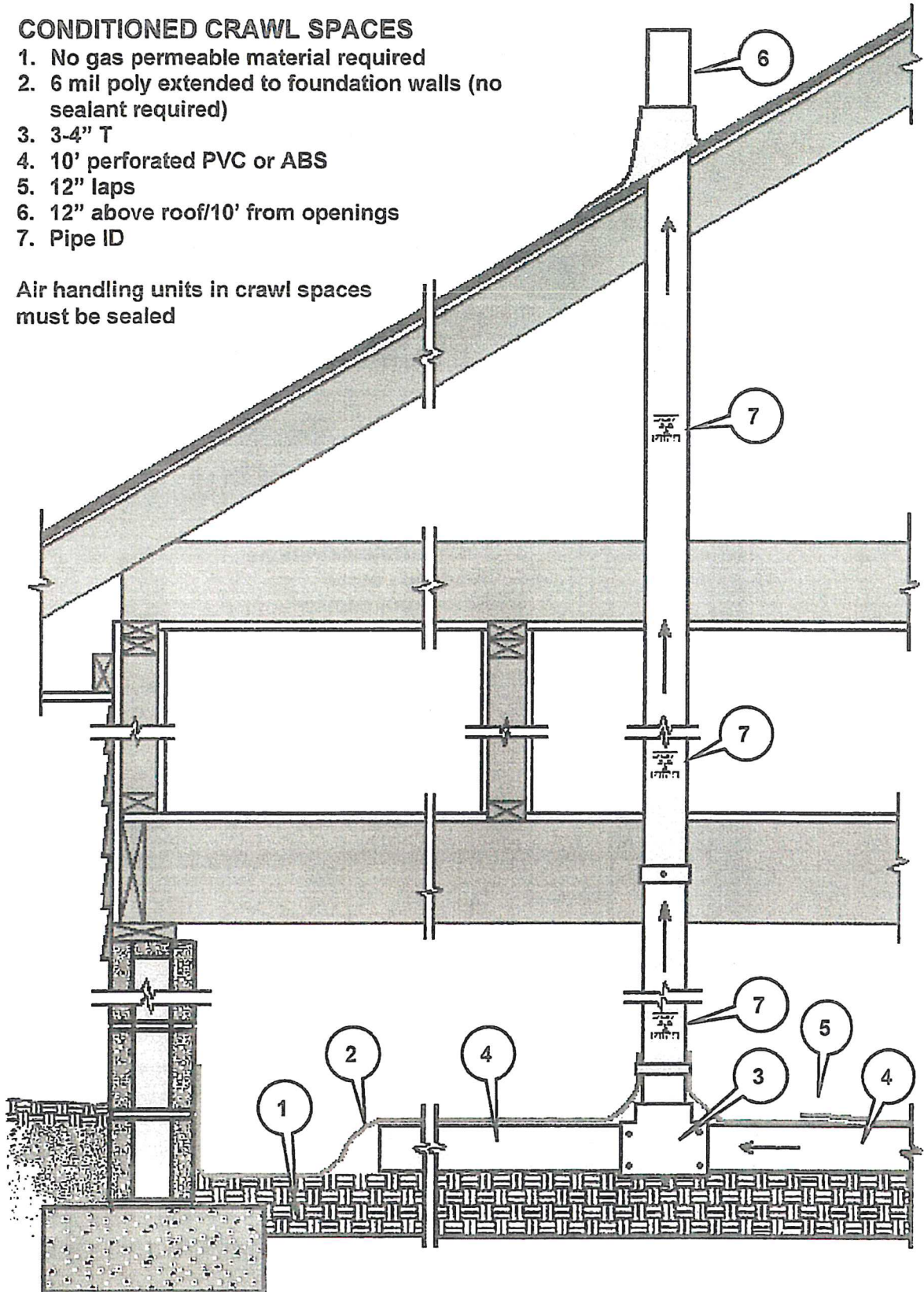
**MULTI-LEVEL BASEMENTS**

- 1. 4" of aggregate or sand
- 2. 6-mil poly
- 3. Seal joints/penetrations
- 4. Solid top course
- 5. Waterproof/dampproof
- 6. 3-4" T
- 7. 10' perforated PVC or ABS
- 8. 12" above roof/10' from openings
- 9. Pipe ID
- 10. Approved fan
- 11. Monitoring system

## CONDITIONED CRAWL SPACES

1. No gas permeable material required
2. 6 mil poly extended to foundation walls (no sealant required)
3. 3-4" T
4. 10' perforated PVC or ABS
5. 12" laps
6. 12" above roof/10' from openings
7. Pipe ID

Air handling units in crawl spaces must be sealed



# New Construction Energy Code Compliance Certificate (2015 MN Energy Code)

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

Date Certificate Posted:

Mailing Address of the Dwelling or Dwelling Unit \_\_\_\_\_  
 City \_\_\_\_\_

Name of Residential Contractor \_\_\_\_\_  
 MN License Number \_\_\_\_\_

## THERMAL ENVELOPE

Insulation Location	Total R-Value of all Types of Insulation	Type: Check All That Apply							
		None or Not Applicable	Fiberglass, Blown	Fiberglass, Batts	Foam, Closed Cell	Foam Open Cell	Mineral Fiberboard	Rigid, Extruded Polystyrene	Rigid, Isocyanurate
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 \_\_\_\_\_

## RADON CONTROL SYSTEM

Passive (No Fan) \_\_\_\_\_  
 Active (With fan and monometer or other system monitoring device) \_\_\_\_\_  
 Location (or future location) of Fan: \_\_\_\_\_  
 Other Please Describe Below: \_\_\_\_\_

**Building Envelope Air Tightness:**  
 (Blower Door Test Results)

**Windows and Doors:**  
 Average U-Factor (excludes skylights and one door): U = \_\_\_\_\_  
 Solar Heat Gain Coefficient (SHGC): \_\_\_\_\_

## MECHANICAL SYSTEMS

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

## MECHANICAL VENTILATION SYSTEM

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): \_\_\_\_\_

**Select Type**

Heat Recover Ventilator (HRV) Capacity in cfm's:	Low:	High:	Combustion Air <i>Select a Type</i>
Energy Recover Ventilator (ERV) Capacity in cfm's:	Low:	High:	
Balanced Ventilation capacity in cfm's:			Passive
Location of fan(s), describe:			Other, describe:
Capacity continuous ventilation rate in cfm's:			Location of duct or system:
Total ventilation (intermittent + continuous) rate in cfm's:			Cfm's:

Round duct (in inches): \_\_\_\_\_ C

Metal duct (in inches): \_\_\_\_\_

## Heating or Cooling Ducts Outside Conditioned Space

**Duct System Air Tightness:**  
 (Only if there is ductwork outside the conditioned space)

Not Applicable, all ducts located in conditioned space \_\_\_\_\_  
 R-Value \_\_\_\_\_

Job Site Address: \_\_\_\_\_

# “CATEGORY 1” ALTERNATE FOR ONE & TWO FAMILY DWELLINGS

**INSTRUCTIONS:** This alternative may be used for one- and two-family dwellings built to meet the Category 1 requirements of Minnesota Rules, Chapter 7670. Complete Parts A, B, and C. Clearly mark plans with: insulation R-values; window and skylight U-values; size and type of equipment; equipment controls; and location of vapor retarder and windwash barriers. More detailed information can be found in the *Minnesota Energy Code* summary sheets available from the Minnesota Department of Commerce.

## Part A. BUILDING ENVELOPE

- Check proposed envelope joint sealing option →  Prescriptive (caulking, gaskets, etc.)  Performance (test per 7670.0470 subp. 7.C.)
- Check thermal energy calculation option used →  “Cookbook” (complete worksheet below)  MnCheck method (attach report)
- Performance (attach U-value 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) and door area is equal or less than allowable percentage.

MINIMUM REQUIREMENTS (for “Cookbook” option only)	
<input type="checkbox"/>	Ceiling Insulation: Minimum R-38 with 7½” energy heel; or Minimum R-44 with low truss heel; or Minimum R-38 with R-5 sheathing when no attic.
<input type="checkbox"/>	Entry Doors: Max. U-value of 0.30 or 1¼” solid wood with storm
<input type="checkbox"/>	Rim Joist Insulation: Minimum R-19
<input type="checkbox"/>	Floors over unconditioned spaces: Minimum R-24
<input type="checkbox"/>	Foundation Insulation: Minimum R-10
<input type="checkbox"/>	Foundation windows: ½” insulated glass, wood or vinyl frame

**TABLE FOR DETERMINING MAXIMUM WINDOW AND DOOR AREA**

Maximum Allowable Total Window and Door Area as a Percentage of Exposed Wall →	12%	14%	16%	18%	20%	22%	24%	26%	28%
<b>Wall Type (Standard Framing):</b>	<b>Maximum Average Window U-value (except foundation windows):</b>								
<input type="checkbox"/> 2x4, R-13 insulation, R-7 sheathing	0.55	0.47	0.41	0.36	0.33	0.30	0.27	0.25	0.23
<input type="checkbox"/> 2x4, R-15 insulation, R-5 sheathing	0.52	0.45	0.39	0.35	0.31	0.28	0.26	0.24	0.22
<input type="checkbox"/> 2x6, R-19 insulation, < R-5 sheathing	0.48	0.41	0.36	0.32	0.29	0.26	0.24	0.22	0.21
<input type="checkbox"/> 2x6, R-19 insulation, R-5 sheathing	0.56	0.48	0.42	0.37	0.34	0.31	0.28	0.26	0.24
<input type="checkbox"/> 2x6, R-21 insulation, < R-5 sheathing	0.51	0.43	0.38	0.34	0.30	0.28	0.25	0.23	0.22
<input type="checkbox"/> 2x6, R-21 insulation, R-5 sheathing	0.58	0.50	0.44	0.39	0.35	0.32	0.29	0.27	0.25
<b>Wall Type (Advanced Framing):</b>	<b>Maximum Average Window U-value (except foundation windows):</b>								
<input type="checkbox"/> 2x6, R-19 insulation, < R-5 sheathing	0.52	0.45	0.39	0.35	0.31	0.28	0.26	0.24	0.22
<input type="checkbox"/> 2x6, R-19 insulation, R-5 sheathing	0.58	0.50	0.44	0.39	0.35	0.32	0.29	0.27	0.25
<input type="checkbox"/> 2x6, R-21 insulation, < R-5 sheathing	0.55	0.47	0.41	0.36	0.33	0.30	0.27	0.25	0.23
<input type="checkbox"/> 2x6, R-21 insulation, R-5 sheathing	0.60	0.52	0.46	0.41	0.36	0.33	0.30	0.28	0.26

Window U-value:  Source:  NFRC  ASHRAE 1993 Handbook

100 x  ÷  =  % <  %

window & door area      gross exposed wall area      DESIGN      ALLOWABLE (from table above)

## MINNESOTA ENERGY CODE — WHICH RULES MAY I USE ?

TYPE OF RESIDENTIAL BUILDING	APPLICABLE RULES
Detached R-3 occupancy 1- and 2-family dwellings Examples: single family, twin homes, duplexes	Chapter 7672; or Chapter 7670 “Category 1” with statutory depressurization and ventilation requirements
Attached R-3 occupancy dwellings Examples: triplex townhouses and row houses	Chapter 7674; or Chapter 7670 with either “Category 1” or “Category 2” provisions
R-1 occupancy buildings of 3 stories or less Examples: condominiums or apartments	Chapter 7674; or Chapter 7670 with either “Category 1” or “Category 2” provisions
R-1 occupancy buildings over 3 stories high Examples: high rise condos or apartments	Chapter 7676

# Part B. DEPRESSURIZATION PROTECTION

Check option used:  Fuel burning equipment (complete schedules below)  No fuel burning equipment

### INSTRUCTIONS

- Step 1. Complete the *Combustion Equipment Schedule* below. Only equipment with a Y (Yes) may be selected under the "Category 1" alternate.
- Step 2. Complete *Exhaust/Make-up Air Schedule* on the right if direct or power vented or solid fuel atmospheric vent space heating equipment is selected.

EXHAUST / MAKE-UP AIR SCHEDULE*	
Exhaust devices over 300 cfm	Flow
	cfm
	cfm
	cfm

### COMBUSTION EQUIPMENT SCHEDULE (check all types proposed)

Space heating – nonsolid fuel	<input type="checkbox"/> Sealed combustion	Y	Hearth – nonsolid fuel	<input type="checkbox"/> Sealed combustion	Y	
	<input type="checkbox"/> Direct or power vented	Y*		<input type="checkbox"/> Direct or power vented	Y	
	Atmospherically vented	N		Atmospherically vented	N	
Water heating – nonsolid fuel	<input type="checkbox"/> Sealed combustion	Y	Space heating – solid fuel	<input type="checkbox"/> Atmospherically vented	Y*	
	<input type="checkbox"/> Direct or power vented	Y		Water heating – solid fuel	<input type="checkbox"/> Atmospherically vented	Y
	Atmospherically vented	N		Hearth – solid fuel	<input type="checkbox"/> Atmospherically vented	Y

\* If atmospherically vented solid fuel or direct or power vented nonsolid fuel space heating is installed, then make-up air to match flow is required for each individual exhaust device which exceeds 300 cubic feet per minute.

# Part C1. VENTILATION

### VENTILATION QUANTITY

(Mechanical ventilation must be provided per the larger quantity calculated below)

cubic feet x 0.00583 /minute =  cfm (  x 15 cfm/bedroom) + 15 cfm =  cfm  
 volume of habitable rooms number of bedrooms

### VENTILATION FAN SCHEDULE

Check method(s) proposed →  Exhaust only  Balanced (heat recovery ventilator, air exchanger, etc.)

Fan description or location →					TOTALS
VENTILATION AS DESIGNED	Intake	cfm	cfm	cfm	cfm
	Exhaust	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 C2. VENTILATION

(Submit Part C2 upon completion of system verification†)

✂ -----  
 Job Site Address: \_\_\_\_\_ Permit Number \_\_\_\_\_

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

† Ventilation rate must be measured and verified when the performance option is used in lieu of the prescriptive option for the sealing of joints in the building conditioned envelope (from Part A).

**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 \_\_\_\_\_

**MINNESOTA ENERGY CODE REQUIREMENTS FOR FOUNDATION INSULATION**

EXTERIOR FOUNDATION INSULATION – GENERAL REQUIREMENTS	INTERIOR FOUNDATION INSULATION – GENERAL REQUIREMENTS
<ul style="list-style-type: none"> <li>• Must be of water resistant materials manufactured for its intended use.</li> <li>• Must be installed according to the manufacturer’s specifications.</li> <li>• Must comply with ASTM C578 (rigid), C1621 (semi-rigid), C1029 (spray-applied), or C1289 (rigid), as applicable.</li> <li>• Must have a rigid, opaque and weather resistant protective covering to prevent the degradation of the insulation’s thermal performance.               <ul style="list-style-type: none"> <li>○ The protective cover must cover the exposed exterior insulation and extend a minimum of 6-inches below grade.</li> <li>○ The insulation and protective covering must be flashed with corrosion resistant flashing applied in such manner as to prevent entry of water into the wall cavity or penetration of water into the building structural frame components.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Masonry foundation walls must be drained through the masonry block cores to an approved interior drainage system.</li> <li>• If a frame wall is installed it must NOT be in direct contact with the foundation wall, unless the INTERIOR side of the foundation has been WATERPROOFED.</li> <li>• Must meet the requirements for rigid interior insulation, spray-applied interior insulation, semi-rigid interior insulation, or unfaced fiberglass batt interior insulation.</li> <li>• Must comply with the following interior air barrier requirements:               <ul style="list-style-type: none"> <li>○ Air barrier to be installed on warm-in-winter side of thermal insulation.</li> <li>○ Areas of potential leakage in the building thermal envelope shall be caulked, gasketed, weather-stripped, or otherwise sealed with an air barrier material, suitable film or solid material to form an effective barrier between conditioned and unconditioned spaces. The Integrity of all air barriers must be maintained. Sealing methods between dissimilar materials must allow for expansion and contraction.</li> </ul> </li> </ul>
BASEMENT FOUNDATIONS AND CRAWL SPACES – GENERAL REQUIREMENTS	SLAB ON GRADE AND BASEMENT WALK OUT FOUNDATIONS – GENERAL REQUIREMENTS
<ul style="list-style-type: none"> <li>• Must be installed to an R-10. Adding additional insulation to increase R-value or adding additional vapor retarder to foundation wall assemblies is prohibited, except for the installation of R-13 when using fiberglass batt insulation on the interior.</li> <li>• Must be insulated from the top of the foundation wall down to the top of the footing or from the top edge of the interior wall to the top of the slab if insulation is on the interior.</li> </ul>	<ul style="list-style-type: none"> <li>• Must be insulated to an R-10. Adding additional insulation to increase R-value or adding additional vapor retarder to foundation wall assemblies is prohibited, except for the installation of R-13 when using fiberglass batt insulation on the interior.</li> <li>• Insulation must extend to the designed frost line (60-inches here) or to the top of footing, whichever is less.</li> <li>• The top edge of the insulation installed between the exterior wall and the edge of the interior slab can be cut at a 45-degree angle away from the exterior wall.</li> </ul>
LOCATIONS WHERE THE AIR BARRIER MUST BE SEALED:	LOCATIONS WHERE THE AIR BARRIER MUST BE SEALED: (continued)
<ul style="list-style-type: none"> <li>• Walls, floors, ceilings, overhangs, knee-walls, and floor rim joist areas separating conditioned from unconditioned spaces.</li> <li>• At all joints, seams and penetrations of the building thermal envelope.</li> <li>• At all electrical, plumbing, mechanical and other penetrations of the interior air barrier.</li> <li>• At all interconnections in the thermal envelope between concealed vertical and horizontal spaces such as soffits, drop ceilings, cove ceilings and similar locations.</li> </ul>	<ul style="list-style-type: none"> <li>• In concealed spaces between stairs, fireplace framing, partition walls, chases, tubs and showers directly adjacent to the building thermal envelope.</li> <li>• At openings between framing members and window and door frames and jams</li> </ul>

INTEGRAL FOUNDATION INSULATION	RIGID INTERIOR INSULATION	SPRAY-APPLIED INTERIOR INSULATION	SEMI-RIGID INTERIOR INSULATION	UNFACED FIBERGLASS BATT INSULATION
Integral foundation insulation is an engineered poured wall system with a rigid foam core. Each manufacturer will have specific requirements which must be followed.	<ul style="list-style-type: none"> <li>Must comply with ASTM C578 or C1289.</li> <li>Dampproofing, waterproofing, or a water repellent must be applied to the exposed above grade foundation walls or a layer of dampproofing or waterproofing must be installed on the <u>entire inside surface</u> of the foundation wall. Water repellent materials must comply with ASTM E514.</li> <li>Must be in contact with the foundation wall surface.</li> <li>Vertical edges must be sealed with acoustic sealant.</li> <li>All interior joint, edges and penetrations must be sealed against air and water vapor penetration.</li> <li>Horizontally continuous acoustic sealant must be installed between the foundation wall and the insulation at the top of the foundation wall.</li> <li>Horizontally continuous acoustic sealant must be installed between the basement floor and the bottom insulation edge.</li> <li>The insulation must not be penetrated by the placement of utilities or by fasteners or connectors used to install a frame wall.</li> </ul>	<p><b>CLOSED CELL POLYURETHANE</b></p> <ul style="list-style-type: none"> <li>Must comply with ASTM 1029 with a permeance of not greater than 1.</li> <li>Must be sprayed directly onto the foundation wall surface.</li> <li>There must be a 1-inch minimum gap between the foundation wall surface and the framing.</li> <li>The insulation must not be penetrated by the placement of utilities.</li> <li>All through penetrations must be sealed.</li> </ul>	<ul style="list-style-type: none"> <li>Must comply with ASTM C1621 with a maximum permeance of 1.1 per inch.</li> <li>Must have a minimum density of 1.3 pcf and must have a fungal resistance per ASTM C1338.</li> <li>Must be in contact with the foundation wall surface.</li> <li>Vertical edges must be sealed with acoustic sealant.</li> <li>All interior joints, edges and penetrations must be sealed against air and water vapor penetration.</li> <li>Horizontally continuous acoustic sealant must be installed between the foundation wall and the insulation at the top of the foundation wall.</li> <li>Horizontally continuous acoustic sealant must be installed between the basement floor and the bottom insulation edge.</li> </ul>	<ul style="list-style-type: none"> <li>Waterproofing must be applied to the <u>entire inside surface</u> of the foundation wall.</li> <li>The top and bottom plates must be air sealed to the foundation wall surface and the basement floor.</li> <li>An air barrier material and vapor retarder material with a minimum permeance of at least 1 according to ASTM E96 to be installed in the following manner: <ol style="list-style-type: none"> <li>Must be air sealed to the framing with construction adhesive or equivalent at the top and bottom plates and where the adjacent wall is insulated; and</li> <li>Must be air sealed to utility boxes and other penetrations; and</li> <li>All seams must be overlapped at least 6-inches and sealed with compatible sealing tape or equivalent.</li> </ol> </li> </ul> <p><b>NOTE: This is the only application where exceeding R-10 foundation insulation is permitted. In this application, it is allowable to install up to an R-13 fiberglass batt.</b></p>
		<p><b>½ LB. FREE RISE OPEN CELL FOAM</b></p> <ul style="list-style-type: none"> <li>Must be sprayed directly onto the foundation wall surface.</li> <li>There must be a 1-inch minimum gap between the foundation wall surface and any framing.</li> <li>The insulation must not be penetrated by the placement of utilities.</li> <li>All through penetrations must be sealed.</li> </ul>		

**INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>(a)</sup>**

	Fenestration <sup>(b)</sup> U-Factor	Skylight U-Factor	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R- Value <sup>(f)</sup>	Floor R-Value	Foundation Wall & Rim Joist R-Value	Slab <sup>(c)</sup> R-Value & Depth	Crawl Space Wall R-Value
Northern Climate Zone	0.35	0.60	44	19	15	30 <sup>(d)</sup>	10	10, 5 feet	10
Southern Climate Zone	0.35	0.60	38	19 or 13 + 5 <sup>(e)</sup>	15	30 <sup>(d)</sup>	10	10, 3.5 feet	10

**Footnotes:** (a) R-values are minimums. U-factors are maximums. R-19 shall be permitted to be compressed into a 2 X 6 cavity.

(b) The fenestration U-factor column excludes skylights.

(c) R-5 must be added to the required slab edge R-values for heated slabs.

(d) Or insulation sufficient to fill framing cavity, R-19 minimum.

(e) N/A in Northern Climate

(f) When using log type construction for thermal mass walls, the following will apply: 1) A minimum of a 7-inch diameter log shall be used. 2) The U-value of the fenestration products must be 0.31 overall average, or better.

Inspector  
JAMES Bjorklund  
218-590-0861



## Electrical Inspection Checklist for One-Family Homes

Based on the  
**2020 National Electrical Code® (NEC®)**

### **NOTE:**

The Board of Electricity adopted the 2020 National Electrical Code (NEC) with an effective date of Nov. 17, 2020. Accordingly, the Department of Labor and Industry began enforcing the 2020 NEC on Nov. 17, 2020. Electrical work authorized by permits issued on or after this date must comply with the 2020 NEC. Electrical license examinations are based on the requirements of the 2020 NEC beginning Jan. 1, 2021.

However, due to concerns regarding the availability of 2-pole GFCI circuit breakers, the department delayed enforcement of the requirements for 250-volt GFCI receptacles and outlet requirements found in NEC 210.8(A) and 210.8(F).

**On April 5, 2021, DLI will begin enforcing the 250-volt GFCI receptacle and outlet requirements found in NEC 210.8(A) and 210.8(F).** Industry circuit breaker manufacturers have confirmed that supply-chain challenges will be resolved in March 2021. Electrical work authorized by permits issued on or after April 5, 2021, must comply with the 2020 NEC.

**001** An owner (i.e. homeowner) who files a Request for Electrical Inspection form (i.e. permit) with the Department of Labor and Industry or other electrical inspection authority is signing an affidavit and declaring they own and occupy the residence and they will personally perform all of the electrical work, including the planning and laying out of the electrical work.

**002** The term "owner" is defined in law as a natural person who physically performs electrical work on premises the person owns and actually occupies as a residence or owns and will occupy as a residence upon completion of construction. Owner and homeowner are essentially synonymous for the purpose of this explanation.

**003** A separate permit with the required fees must be submitted to the Department at or before the start of any electrical work that is required by law to be inspected.

**004** A homeowner is exempt from having to possess a personal electrical license. However, It is illegal for unlicensed homeowners to install wiring in two-family dwellings, apartment buildings, condo buildings or other common interest community settings, certain townhouse buildings, manufactured homes in parks, recreational vehicles in parks, floating buildings on public waterways, or in or on any property that is rented, leased or occupied by others.

**005** All wiring including underground cable and conduit must be inspected at the rough-in stage before it is concealed by insulation, sheetrock, backfill or other materials. Except for the final connection to switches, receptacles and lighting fixtures, all equipment grounding wires in boxes must be spliced and pigtailed for the rough-in inspection.

**006** The installer must notify the inspector for final inspection when the wiring is complete and before the wiring is utilized and the space is occupied.

**007** If wiring is concealed before inspection, the person responsible for concealing the wiring is responsible for all costs associated with uncovering and replacing the covering material.



## **GENERAL CIRCUIT REQUIREMENTS**

**008** **NEC 406.4 and 406.12** All 125- and 250-volt, 15- and 20- amp receptacles installed or replaced in dwelling units shall be listed as tamper-resistant (TR). Three exceptions include receptacles located 5½ feet or more above the floor, a receptacle in space dedicated for an appliance that is not readily moved and receptacles that are part of a luminaire.

**009** **NEC 210.12** All branch circuits supplying 125-volt, 15- and 20- amp outlets or devices in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, laundry areas, closets, hallways or similar areas shall be protected by a listed combination-type AFCI device. AFCI protection is also required where branch circuit wiring in the above locations is modified, replaced or extended.

**010** **NEC 210.11 and 422.12** In addition to the branch circuits installed to supply general illumination and receptacle outlets in dwelling units, the following minimum requirements apply:

- Two 20-amp circuits for the kitchen receptacles
- One 20-amp circuit for the laundry receptacles
- One 20-amp circuit for the bathroom receptacles
- One 20- amp circuit for garage receptacles
- One individual branch circuit for central heating equipment. (i.e. furnace)

**011** **NEC 406.4 and 406.9** Receptacles that are installed or replaced in wet locations shall be listed as weather-resistant “WR” and shall have an enclosure that is weatherproof with the cord inserted. Covers shall be marked “extra duty.”

**012** **NEC 300.3** All conductors of the same circuit, including grounding and bonding conductors shall be contained in the same raceway, cable or trench.

**013** **NEC 408.4** Every circuit and circuit modification shall be legibly identified as to its clear, evident and specific purpose or use in sufficient detail on a directory located on the face or inside of the electrical panel doors.

**014** **NEC 240.4** Conductors shall be protected in accordance with their ampacity per Table 310.15(B)(16) and 240.4(D)

### **NEC 310.15 Maximum Overcurrent Protection**

Fuse or Circuit Breaker Size	Minimum Wire Size	
	Copper	Aluminum
15 amp	14	N/A
20 amp	12	N/A
30 amp	10	8
40 amp	8	6
50 amp	6	4

**For certain specific installations, conductors that supply motors, air-conditioning units, and other equipment may be permitted to have overcurrent protection that exceeds the basic limitations in the above chart.**

- 015** NEC 200.11 and 406.3 Receptacle outlets shall be of the grounding-type, be grounded and have the proper polarity.
- 016** NEC 210.52 Receptacle outlets in habitable rooms shall be installed so that no point measured horizontally along the floor line in any wall space is more than 6-feet from a receptacle outlet. A receptacle outlet shall be installed in each wall space 2-feet or more in width.
- 017** NEC 210.52 At kitchen countertops, receptacle outlets shall be installed so that no point along the wall line is more than 24 inches measured horizontally from a receptacle outlet in that space. Countertop spaces separated by range tops, sinks or refrigerators are separate spaces.
- 018** NEC 210.52 Island countertop, peninsular countertops and/or work surfaces shall have at least one receptacle outlet shall be provided for the first 9 ft<sup>2</sup>, or fraction thereof, of the countertop or work surface. A receptacle outlet shall be provided for every additional 18 ft<sup>2</sup>, or fraction thereof, of the island countertop, peninsular countertop, or work surface. When installing receptacle outlets that serve a peninsular countertop surface, at least one receptacle outlet shall be located within 2 feet of the outer end of a peninsular countertop or work surface. A peninsular countertop shall be measured from the connected perpendicular wall. Other than the receptacle outlet located within 2 feet of the outer edge of a peninsular countertop surface, the required receptacle outlets shall be permitted to be located as determined by the installer, designer, or building owner.
- 019** NEC 210.52 & 406.9 At least one receptacle outlet accessible from grade shall be installed at the front and back of a dwelling with an extra duty cover that is weatherproof, whether or not an attachment plug cap is inserted in the receptacle outlet.
- 020** NEC 210.52 Balconies, decks and porches accessible from inside a dwelling unit shall have at least one receptacle outlet located less than 6½ feet above the floor.
- 021** NEC 210.52 In attached and detached garages at least one receptacle outlet shall be installed for and in each vehicle bay within 5½ feet from the floor.
- 022** NEC 406.9 The required bathroom receptacle(s) shall not be installed within a zone measured 3 feet horizontally and 8 feet vertically from the top of the bathtub rim or shower stall threshold. The identified zone is all-encompassing and shall include the space directly over the tub or shower stall. However, if the size of the bathroom is too small and the required distance (zone) requirements can't be met, the receptacle(s) shall be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall within the room.

### **GFCI PROTECTION (GFCI)**

- 023** NEC 210.8(A) and 406.4 The ground-fault circuit-interrupter shall be installed in a readily accessible location. Ground-fault circuit-interrupter (GFCI) protection shall be provided for all 125-volt through 250 volt, receptacle outlets installed outdoors, indoor damp and wet locations, in boathouses, crawl spaces, basements, laundry areas, garages, accessory buildings, bathrooms, at kitchen countertops and within 6-feet of the top inside edge of all sink bowls, and within 6-feet from the outside edge of bathtubs and shower stalls. GFCI protection shall be provided for all lighting outlets installed in crawl spaces.
- 024** NEC 210.8(F) GFCI protection shall be provided for outdoor outlets that are readily accessible. This would include air conditioners, heat pumps, split mini HVAC equipment and similar electrical equipment. It would not include and submersible well or sewer lift pump branch circuits.
- 025** NEC 422.5 GFCI protection shall be provided for all dishwashers and sump pumps that are permanently connected or cord-and-plug connected.
- 026** NEC 680.71 Hydro-massage bathtubs shall be supplied by an individual branch circuit and shall have ground-fault circuit-interrupter protection.
- 027** NEC 680.73 Hydro-massage bathtub equipment shall be accessible without damaging the building structure or finish. When accessible through an access panel, the receptacle outlet shall be within 1-foot of and face the opening.
- 028** NEC 680.21(C) All outlets supplying 125- or 240-volt pool pump motors shall be provided with GFCI protection.

**029** **NEC 680.26** An equipotential bonding grid to mitigate step and touch voltage potential shall be installed at outdoor swimming pools, spas and hot tubs and at electrical equipment installed outdoors adjacent to natural and artificially made bodies of water.

### WIRING METHODS

**030** **NEC 314.23** All electrical boxes shall be rigidly secured to the building structure.

**031** **NEC 314.27(C)** A listed fan box or a ceiling box with access to a framing member shall be installed in all locations where a ceiling paddle could be installed in a habitable room.

**032** **NEC 334.30** Type NM (nonmetallic) cables shall be secured every 4<sup>1</sup>/<sub>2</sub>-feet and within 12 inches of each box.

**033** **NEC 314.17** The outer jacket of type NM cable shall be secured to the box and extend into the box at least ¼ inch.

**034** **NEC 300.14** The minimum length of conductors including equipment grounding conductors in all boxes shall be 6-inches, with at least 3-inches of length extended outside the box.

**035** **NEC 300.4** Cables and raceways shall be protected from damage. Where installed through holes in wood framing, the edge of the hole shall be not less than 1¼-inch from the nearest edge of the wood member or shall be protected by a 1/16-inch steel plate. Note: Using the inside hole on single-gang boxes does not allow for the 1 ¼-inch clearance.

**CAUTION: Refer to the Building Code for restrictions on boring, cutting, drilling and notching of wood framing members**

**036** **NEC 300.22** Type NM cable shall not be installed in environmental plenum air spaces, but may be installed perpendicular to the long dimension of joist or stud spaces.

**037** **NEC 110.14** Terminals for more than one conductor shall be identified. Where there is more than one equipment grounding wire they shall be spliced together with a “pigtail” and attached to the singular grounding terminal of the device.

**038** **NEC 200.7** Where permanently re-identified at each location where it is visible and accessible, the conductor with white colored insulation in type NM cable may be used as an ungrounded (hot) conductor. The re-identified conductor shall not be used as the return conductor from a switch to an outlet.

**039** **NEC 250.134** All non-current carrying metal parts of electrical equipment, including raceways, metal boxes and equipment shall be connected to an equipment grounding conductor.

**040** **NEC 110.12** Unused openings in boxes shall be effectively closed. A nonmetallic box shall be replaced if cable openings are punched out but not used.

**041** **NEC 408.41** Each grounded circuit conductor (i.e. neutral) within a panelboard shall terminate in an individual terminal.

**042** **NEC 404.2** Generally, the neutral circuit conductor for the lighting circuit shall be installed at locations where switches control lighting loads, unless the wiring is installed in a raceway, the switch box remains accessible, or the switch controls a receptacle load. Dimmers often require a neutral connection.

**043** **NEC 314.29** Junction boxes shall be accessible without removing any part of the building.

**044** **NEC 314.16** The number of conductors and devices to be contained within electrical boxes determines the box size. Nonmetallic boxes are marked with their cubic inch capacity.

Example: a box with four 14/2 w/ground type NM cables:

Cubic Inches Required for Boxes				
Conductor Size	14 AWG	12 AWG	10 AWG	
Each insulated wire	2	2.25	2.5	
All grounding wires combined	2	2.25	2.5	
Each switch or receptacle	4	4.5	5	
All internal cable clamps	2	2.25	2.5	

**Example:**

8 insulated wires	= 16 cubic inches
All 4 grounding wires	= 2 cubic inches
1 switch	= 4 cubic inches
1 receptacle	= 4 cubic inches
All cable clamps	= 2 cubic inches
<b>Minimum Box Volume</b>	<b>= 28 cubic inches</b>

**NOTE: If you have more than 4 equipment grounding conductors in a box, a further adjustment of ¼ volume allowance needs to be added for each conductor based on the largest wire in the box.**

**045 NEC 410.16** Luminaires in clothes closets shall have the following minimum clearances from the defined storage space:

- 12 inches for totally enclosed surface mounted incandescent or LED luminaires on the ceiling or above the door
- 6 inches for totally enclosed recessed incandescent or LED luminaires on the ceiling or above the door
- 6 inches for surface mounted or recessed fluorescent luminaires on the ceiling or above the door

**046 NEC 410.2** Defined closet storage space extends from the floor to a height of 6-feet or the highest clothes-hanging rod and 24-inches from the sides and back of the closet walls, and continuing vertically to the ceiling parallel to the walls at 12-inches or the shelf width, whichever is greater.

**047 NEC 410.16** Incandescent luminaires with open or partially enclosed lamps and pendant fixtures or lampholders are not permitted in clothes closets.

**048 NEC 410.10** Luminaires installed in wet or damp locations shall be installed so that water cannot enter or accumulate and shall be marked as suitable for use in wet or damp locations, correspondingly.

**EQUIPMENT LISTING AND LABELING**

**049 Minnesota Rules 3801.3620** All electrical equipment, including luminaires, devices and appliances used as part of or in connection with an electrical installation shall be listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) as having been tested and found suitable for a specific purpose.

**050 NEC 110.3** Listed electrical equipment shall be installed and used in accordance with the listing requirements and the manufacturer's installation instructions.

**ELECTRICAL SERVICES**

**051 NEC 230.70** The service disconnecting means shall be installed at a readily accessible location either outside a building or structure, or inside nearest the point of entrance of the service-entrance conductors.

**052 NEC 310.12 Conductor Sizes For 120/240-Volt, 3-Wire, Single-Phase, Dwelling Services and Feeders (where the service or feeder supplies the entire load of the home)**

Copper	Aluminum	Service Rating
4 AWG	2 AWG	100 amps
1 AWG	2/0	150 amps
2/0	4/0	200 amps
400 kcmil	600 kcmil	400 amps

- 053** NEC 110.14 Conductors of dissimilar metals shall not be intermixed unless the device is listed for the purpose.
- 054** NEC 230.67 A dwelling electrical service must be protected by a Type 1 or Type 2 surge protective device.
- 055** NEC 230.85 Each dwelling shall have an outdoor readily accessible emergency disconnect installed. The emergency disconnect could be a service disconnect for the dwelling or it could be a disconnect supplied by the serving utility. If the disconnect is the service disconnect, it must be labeled as the "EMERGENCY DISCONNECT- SERVICE DISCONNECT". If the disconnect is provided by the serving utility, and is not the service disconnect, the disconnect must be labeled "EMERGENCY DISCONNECT – NOT SERVICE EQUIPMENT".
- 056** NEC 300.7 Portions of raceways or sleeves passing from the interior to the exterior of a building or subject to different temperatures shall be filled with an approved material (e.g. Duxseal) to prevent condensation from entering equipment.
- 057** NEC 230.54 Service-entrance and overhead service conductors shall be arranged so that water will not enter the service enclosure.
- 058** NEC 300.9 The interior of raceways installed in wet locations above grade shall be considered wet locations.
- 059** NEC 300.4 Conductors 4 AWG or larger shall be protected by a bushing when entering an enclosure through a raceway.
- 060** NEC 230.70 The service disconnecting means shall not be located in a bathroom.
- 061** NEC 240.24 Overcurrent devices shall be readily accessible and not located in bathrooms or in the vicinity of easily ignitable materials such as clothes closets.
- 062** NEC 408.36 Back-fed overcurrent devices shall be secured by an additional approved fastener that requires a tool for removal.
- 063** NEC 110.26 Working space shall be a minimum of 3-feet in the direction of access to live parts and the width of the equipment or 30 inches, whichever is greater, extending from the floor to 6½-feet and shall not be used for storage. The space below and above the electrical panelboard from the floor to the ceiling is dedicated for electrical wiring and no piping, ducts or apparatus shall be in this space.
- 064** NEC 110.26 Illumination shall be provided for the working space about service equipment and panelboards.

### **GROUNDING AND BONDING**

- 065** NEC 250.28 The main bonding jumper (*generally the green bonding screw or strap provided by the panel manufacturer*) shall be installed in the main service panel.
- 066** NEC 250.32 Detached buildings or structures supplied by a feeder or branch circuit shall have an equipment grounding conductor installed with the supply conductors and connected to the grounding electrode system at the building or structure.
- 067** NEC 250.50 All grounding electrodes that are present at each building or structure shall be bonded together to form the grounding electrode system.
- 068** NEC 250.52 Acceptable grounding electrodes include at least 10-feet of metal underground water pipe, a metal frame of a building or structure, a rod, pipe or plate electrode, a concrete encased electrode or a ground ring.
- 069** NEC 250.53 A metal underground water pipe electrode shall be supplemented by an additional electrode.
- 070** NEC 250.53 Unless a rod, pipe and plate electrode has a resistance to ground of 25 ohms or less, it shall be supplemented with another acceptable electrode other than an underground water pipe.
- 071** NEC 250.104 The interior metal water piping and other metal piping that may become energized shall be bonded to the service equipment with a bonding jumper sized the same as the grounding electrode conductor.
- 072** NEC 250.64 The grounding electrode conductor shall be continuous, securely fastened and protected from physical damage. Grounding electrode conductors are not required to comply with the minimum cover requirements in 300.5

## UNDERGROUND WIRING

**073** NEC 300.5 Direct buried cable or conduit or other raceways shall meet the following minimum cover requirements:

Direct Burial Cable	Rigid or Intermediate Metal Conduit	Nonmetallic Raceway (PVC)
24 inches	6 inches	18 inches

The minimum cover for a 120-volt residential branch circuit rated 20-amps or less and provided with GFCI protection at the source is permitted to be 12-inches.

**074** NEC 300.5 Underground service conductors shall have their location identified by a warning ribbon placed in the trench at least 12-inches above the underground installation.

**075** NEC 300.5 Where subject to ground movement such as Minnesota’s freeze-thaw, winter-summer seasons, direct buried cables and raceways shall be installed with expansion capability to prevent damage to the enclosed conductors or to the connected equipment.

**076** NEC 110.14 Wire splicing devices for direct burial conductors shall be listed for such use.

**077** NEC 300.5 Conductors emerging from underground shall be installed in rigid metal conduit, intermediate metal conduit, or Schedule 80 rigid nonmetallic conduit from 18-inches below grade or the minimum cover distance up to the point of termination above ground.

Equivalent Size of Service Entrance Conductor		Size of the Grounding Electrode Conductor	
Copper	Aluminum	Copper	Aluminum
4 AWG	2	8	6
1 AWG	2/0	6	4
2/0 or 3/0	4/0 or 250	4	2

***This is a general overview of residential electrical requirements. For complete regulations, please refer to the National Electrical Code (NEC) and Minnesota Statutes and Rules***

***Please refer to the department 2020 NEC FAQ for additional information***

<https://www.dli.mn.gov/sites/default/files/pdf/NECFAQ20.pdf>

Minnesota Department of Labor & Industry  
443 Lafayette Road North  
Saint Paul, Minnesota 55155  
(651) 284-5026  
[www.dli.mn.gov](http://www.dli.mn.gov)  
[dli.electricity@state.mn.us](mailto:dli.electricity@state.mn.us)

Online Electrical Permits  
<https://ims.dli.mn.gov>

*Inspector  
James Bjorklund  
218-590-0861*

State and Local Electrical Inspector Directory:

<http://www.dli.mn.gov/business/electrical-contractors/electrical-inspector-directories>



**MINNESOTA DEPARTMENT OF LABOR & INDUSTRY**

Department of Labor and Industry  
Construction Codes and Licensing Division  
443 Lafayette Road N.  
St. Paul, MN 55155

Phone: (651) 284-5012 or 1-800-657-3944  
TTY: (651) 297-4198 Fax: (651) 284-5749

The State of Minnesota adopts a set of construction standards known as the Minnesota State Building Codes (MSBC). The MSBC contains safety requirements relating to structure, mechanical, plumbing, energy, electrical, elevators, manufactured buildings and life safety.

The information in this brochure is for general reference for residential construction projects. Contact your municipal building official regarding permits and specific code requirements for residential construction within your community.

**To confirm if your contractor is licensed in Minnesota contact the:**

Department of Labor and Industry  
Residential Building Contractors  
Phone: (651) 284-5069 or 1-800-657-3944  
[www.dli.mn.gov/ccld/LicVerify.asp](http://www.dli.mn.gov/ccld/LicVerify.asp)  
E-mail: [DLI.Contractor@state.mn.us](mailto:DLI.Contractor@state.mn.us)

[www.dli.mn.gov](http://www.dli.mn.gov)

05-07



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Phone: 811 or (651) 454-0002  
[www.call811.com](http://www.call811.com)



# SMOKE ALARMS and CARBON MONOXIDE DETECTORS

*Guidelines for placement  
and use of smoke alarms  
and carbon monoxide  
detectors.*



### Why are smoke alarms required?

Fire deaths occur in residential buildings more than in any other building type. More than half of all fire deaths in residential buildings occur while the occupants are asleep and are unaware. Death usually results from asphyxiation, long before the fire reaches the occupants.

Smoke alarms installed in a home give an early warning of smoke and give the occupants the critical few moments needed to escape.

To address the loss of life in residential buildings, the Minnesota State Building Code (MSBC) has requirements for the installation of smoke alarms in a home. The 2007 MSBC adopts the 2006 International Residential Code (2006 IRC). All "R" code references provided in this brochure pertain to the 2006 IRC.

In general, the code requires that smoke alarms be provided on each floor of a dwelling and in the corridor giving access to bedrooms and in bedrooms. Alarms in new construction must receive their power from the building wiring and have a battery backup in the event of electrical power loss. During remodeling, where connection to the building wiring is difficult to achieve, battery-operated alarms may be used (R313.1.1).

An important feature of the requirement for alarms being connected into the building's electrical wiring is there must be no disconnecting means other than the primary over current protection (fuse or circuit breaker). Alarms must be wired directly into the building's wiring system and no switches, plugs or mechanical disconnects are permitted between the electric service panel and the alarm.

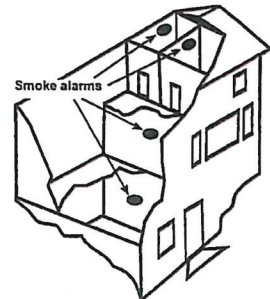
### Specific code requirements

#### General

Dwelling units, congregate residences and hotel or lodging guests rooms that are used for sleeping purposes must be provided with smoke alarms. Alarms must be installed in accordance with the approved manufacturer's instructions.

#### Power source

In new construction, the required smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source. When primary power is interrupted, smoke alarms shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power or in buildings that undergo alterations, repairs or additions regulated by R313.3.



### Smoke detection and notification

All smoke alarms shall be listed in accordance with Underwriters Laboratory 217 and installed in accordance with the provisions of this code and the household fire warning equipment provisions of National Fire Protection Agency (NFPA) 72.

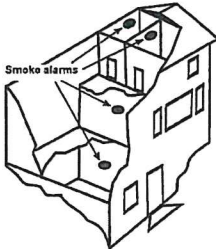
Household fire alarm systems installed in accordance with NFPA 72 that include smoke alarms, or a combination of smoke detector and audible notification device installed as required by this section for smoke alarms, shall be permitted. The household fire alarm system shall provide the same level of smoke detection and alarm as required by this section for smoke alarms in the event the fire alarm panel is removed or the system is not connected to a central station (R313.1).

Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional story of the dwelling, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

When more than one smoke alarm is required to be installed within an individual dwelling unit, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit.

All smoke alarms shall be listed and installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA 72 (R313.2).



### Alterations, repairs and additions

When alterations, repairs or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be equipped with smoke alarms located as required for new dwellings, the smoke alarms shall be interconnected and hard wired.

#### Exceptions:

1. Interconnection and hardwiring of smoke alarms in existing areas shall not be required to be hardwired where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure.
2. Work on the exterior surfaces of dwellings, such as the replacement of roofing or siding are exempt from the requirements of this section.
3. Permits involving alterations or repairs to plumbing, electrical and mechanical are exempt from the requirements of this section (R313.2.1).

### Carbon monoxide alarms alert residents of a toxic, odorless gas

Carbon monoxide (CO) is a toxic, colorless, odorless gas that is formed as a product of the incomplete combustion of carbon or a carbon compound. Poisoning is caused by inhalation of CO. There are many symptoms for CO poisoning including headache, nausea, confusion and shortness of breath. These can lead to convulsion, unconsciousness, coma and death.

CO is produced by combustion engine exhaust, portable propane heaters, barbecues burning charcoal and portable or non-vented natural gas appliances.



State law requires CO detectors be placed in new and existing residential structures in Minnesota where building permits are obtained. The requirement is found at Minnesota Statutes, § 299F.50.

The CO detector effective dates are:

- Jan. 1, 2007: All new residential buildings
- Aug. 1, 2008: Existing single-family homes
- Aug. 1, 2009: Multi-family dwellings

The Department of Public Safety, State Fire Marshal Division lists the code requirements online at [www.fire.state.mn.us](http://www.fire.state.mn.us) or call (651) 201-7200 for more information.

### Smoke detector is just one part of emergency escape plan

A smoke detector is just one part of an emergency escape safety plan. Everyone in the residence should know what a smoke detector alarm sounds like and practice what to do when the alarm is activated, especially if a fire occurs in the middle of the night and no lights are available to aid escape.

When a fire occurs, time is critical to survival. Be sure to select a safe place where everyone can meet after escaping such as a mailbox or sidewalk. Never go back into a burning building for any reason. More fire safety tips are online at [www.firesafety.gov](http://www.firesafety.gov).





**New to the Minnesota State Building Code in 2007 are requirements for automatic sprinkler systems in SOME buildings regulated by the residential building code.**

**Minnesota State Building Code Section 1309.0301**

**R301.1.4 Automatic sprinkler systems (general).** All IRC 2 and IRC 3 buildings shall be provided with an automatic sprinkler system.

**Exception:**

IRC 2 and IRC 3 buildings less than or equal to 9,250 square feet of floor area. Floor area shall include all floors, basements, and garages.

**R301.1.4.1 State licensed facilities IRC 1, IRC 2, and IRC 3** buildings containing facilities licensed by the State of Minnesota shall be provided with a fire suppression system as required by the applicable licensing provisions or this section, whichever is more restrictive.

**R301.1.4.2 Installation requirements.** Where an automatic sprinkler system is required in an IRC 2 and IRC 3 building, it shall be installed in accordance with NFPA 13D 2002 edition and the following: Attached garages are required to have automatic sprinklers with a minimum of one dry head, located within five lineal feet of each door installed in the common wall separating the dwelling unit and the attached garage. Attached covered patios, covered decks, covered porches, and similar structures are required to have automatic sprinklers with a minimum of one dry head for every 20 lineal feet of common wall between the dwelling unit and the covered patios, covered decks, covered porches, and similar structures.

**Exception:**

Attached roofs of covered patios, covered decks, covered porches, and similar structures that do not exceed 40 square feet of floor area.

For the purposes of this section, fire resistance rated floor, wall, or ceiling assemblies separating dwelling units of IRC 2 and IRC 3 buildings shall not constitute separate buildings.

### **Insulated Concrete Form Foundations (ICFs)**

ICF foundations are permitted by the International Residential Code. Plans must be prepared to show compliance with the provisions in the Code, designed according to Tables 404.4(1-3), OR according to the manufacturer's engineered design. Wall thickness, height of unbalanced backfill, soil type, product name and reinforcing specification must be clearly indicated on plans. If the manufacturer's design is used, the design information, including tables and instructions, must be submitted with the permit application and plans.

#### **R404.4**

Insulating concrete form (ICF) foundation walls shall be designed and constructed in accordance with the provisions of this section or in accordance with the provisions of ACI 318. When ACI 318 or the provisions of this section are used to design insulating concrete form foundation walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design unless otherwise required by the state law of the jurisdiction having authority.

#### **R404.4.1**

Applicability limits. The provisions of this section shall apply to the construction of insulating concrete form foundation walls for buildings not greater than 60 feet (18 288 mm) in plan dimensions, and floors not greater than 32 feet (9754 mm) or roofs not greater than 40 feet (12 192mm) in clear span. Buildings shall not exceed two stories in height above-grade with each story not greater than 10 feet (3048 mm) high. Foundation walls constructed in accordance with the provisions of this section shall be limited to buildings subjected to a maximum ground snow load of 70 psf (3.35 kN/m<sup>2</sup>) and located in Seismic Design Category A, B or C.

### **Waterproofing ICFs**

Exterior foundation walls that retain earth and enclose habitable or usable spaces located below grade shall be waterproofed with a membrane extending from the top of the footing to the finished grade. The joints in the membrane shall be lapped and sealed with an adhesive compatible with the waterproofing membrane.

Organic solvent based products such as hydrocarbons, chlorinated hydrocarbons, ketons and esters shall not be used for ICF walls. Such products are not compatible with the EPS and will deteriorate the foam.

The foundation waterproofing product or method must be specified on plans. Verify before choosing the product that it is compatible with the ICR foam product.

### **Interior Finish**

A thermal barrier shall be provided on the building interior in accordance with Section R318.1.2:

#### **R318.1.2**

Foam plastic, except where otherwise noted, shall be separated from the interior of a building by a minimum ½-inch (12.7 mm) gypsum board or an approved finish material equivalent to a thermal barrier to limit the average temperature rise of the unexposed surface to no more than 250°F (121°C) after 15 minutes of fire exposure to the ASTM E 119 standard time temperature curve. The gypsum board shall be installed using a mechanical fastening system in accordance with §RR702.3.5. Reliance on adhesives to ensure that the gypsum board will remain in place when exposed to fire shall be prohibited.

## Summary of Residential Code Requirements 2007

In the Town of Thomson, construction of and improvements to one and two family dwellings and townhouses must be in accordance with the 2007 Minnesota State Building Code (SBC), which includes the 2006 International Residential Code (IRC) and Minnesota Rules Chapter 1309. Copies of the IRC are available at the Minnesota Bookstore (651-297-3000).

Applicable Minnesota Rules are available online at <http://www.buildingcodes.admin.state.mn.us/rules/rules.html>.

The intent of this handout document is to summarize code requirements and regulations to assist in the planning of projects and preparation of construction documents. This is an extensive list, but it is a fraction of the information needed to plan and obtain a permit for residential construction. If you are doing construction requiring a permit, you MUST be familiar with applicable codes and ordinances.

Submitted plans must indicate compliance with applicable requirements and regulations. The permit holder is responsible for ensuring that all elements are in compliance with all applicable codes and regulations, whether or not noted here.

### DEFINITIONS

#### IRC R202, SBC 1309.0202

#### **Fire separation distance**

The distance measured from the building face to the closest interior lot line, to the centerline of a street, alley or public way, or to an imaginary line between two buildings on the property. The distance shall be measured at right angles from the lot line.

#### **Habitable space.**

A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces.

#### **Dwelling**

##### **Single Family**

Any building that contains one dwelling unit used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or occupied for living purposes.

##### **Two Family**

Any building that contains two separate dwelling units with separation either horizontal or vertical on one lot that is used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or occupied for living purposes.

##### **Townhouse**

A single family dwelling unit constructed in a group of two or more attached units in which each unit extends from the foundation to the roof and having open space on at least two sides of each unit. Each single family dwelling unit shall be considered to be a separate building. Separate building service utilities shall be provided to each single family dwelling unit when required by other chapters of the State Building Code.

**OCCUPANCY CLASSIFICATION**

**SBC 1309.0300**

Structures or portions of structures shall be classified with respect to occupancy in one or more of the groups in accordance with Table R300.1.

Table R300.1  
Occupancy Classifications

IRC-1	Dwelling, single family
IRC-2	Dwelling, two family
IRC-3	Townhouse
IRC-3	Accessory structures

**MINIMUM DESIGN LIVE LOADS**

**IRC 301**

Exterior balconies	60 lbs psf
Decks	40 lbs psf
Fire escapes	40 lbs psf
Passenger vehicle garages	50 lbs psf, except elevated garage floors shall support 2000 lbs over 20 si
Unfinished attics w/out storage	10 lbs psf
Unfinished attics w/storage	20 lbs psf
Rooms non-sleeping	40 lbs psf
Sleeping rooms	30 lbs psf
Stairs	40 psf or 300 lbs concentrated over 4 si, whichever produces greater stresses
Guards-in handrails	200 lbs in a single concentrated load applied in any direction at any point along the top

**CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA**

**IRC 301, SBC 1309.0301**

Ground Snow Load	60 lbs psf
Roof Snow Load	42 lbs psf
Wind Speed	90 mph
Wind Exposure Category	Determined on a site specific basis
Seismic Design Category	Not applicable
Frost depth	60 inches
Winter Design Temperature	-20 degrees F
Subject to Damage From:	
Weathering	Severe
Termites	Slight to moderate
Decay	None to slight

**LOCATION ON LOT IRC R302, SBC 1309.0302.1, TOWN OF THOMSON ZONING CODE**

Zoning setback requirements are usually more restrictive than building code requirements.

**Exterior walls.**

Construction, projections, openings, and penetrations of exterior walls of dwellings and accessory buildings shall comply with Table 302.1. These provisions shall not apply to walls, projections, openings, or penetrations in walls that are perpendicular to the line used to determine the fire separation distance. Projections beyond the exterior shall not extend more than 12 inches into areas where openings are prohibited.

**Exceptions:**

1. Detached garages accessory to a dwelling located within 2 feet of a lot line are permitted to eave projections not exceeding 4 inches.
2. Foundation vents installed in compliance with this code are permitted.

Table 302.1 on next page

EXTERIOR WALL ELEMENT	FIRE SEPARATION DISTANCE (See definition for "Fire Separation Distance")	MINIMUM FIRE RESISTANCE RATING
Walls	0 to 5 feet	1-hour with exposure from both sides
	5 feet or more	Fire resistant rated construction not required
Projections	Less than 2 feet	Projections not allowed
	2 to less than 5 feet	1 – hour on the underside. Soffit venting not allowed (equates to one layer of 5/8" type x gypsum sheathing)
	5 feet or more	Fire resistant rated construction not required
Openings	Less than 3 feet	Openings not allowed
	3 to less than 5 feet	Openings allowed up to 25% of wall area
	5 feet or more	Unlimited area of openings allowed
Penetrations	Less than 5 feet	Protected penetrations required in accordance with Section 317.3
	5 feet or more	No protection of penetrations required

#### LIGHT, VENTILATION AND HEATING

#### IRC R303

**Habitable rooms.** Except where adequate artificial light is provided (6 footcandles at 30" above the floor), all habitable rooms shall be provided with glazing area of not less than 8% of the floor area of such rooms. Except where approved mechanical ventilation is provided, natural ventilation shall be through windows, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The minimum openable area to the outdoors shall be 4% of the floor area being ventilated.

**Adjoining rooms.** For the purpose of determining light and ventilation requirements, any room shall be considered as apportion of an adjoining room when at least one-half of the are of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room but not less than 25 square feet (2.32m<sup>2</sup>).

**Bathrooms.** Except where approved artificial light and ventilation are provided, bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 sf, one-half of which must be openable. Ventilation air from the space shall be exhausted directly to the outside.

**Stairway illumination.** All interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landings and treads. Interior stairways shall be provided with an artificial light source located in the immediate vicinity of each landing of the stairway. For interior stairs, the artificial light sources shall be capable of illuminating treads and landings to levels not less than 1 footcandles measured at the center of treads and landings. Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway. Exterior stairways providing access to a basement from the outside grade level shall be provided with an artificial light source located in the immediate vicinity of the bottom landing of the stairway.

**Required glazed openings.** Required glazed openings shall open directly onto a street or public alley, or a yard or court located on the same lot as the building.

**Required heating.** Every dwelling unit shall be provided with heating facilities capable of maintaining a minimum room temperature of 68°F at a point 3' above the floor and 2' from exterior walls in all habitable rooms at the design temperature.

**MINIMUM ROOM AREAS****IRC R304**

**Minimum area.** Every dwelling unit shall have at least one habitable room that shall have not less than 120 sf of gross floor area. The Housing Code requires that for bedrooms occupied by more than one person at least 50 sf of floor area shall be provided for each.

**Other rooms.** Except kitchens habitable rooms shall have a floor area of not less than 70 sf, except every kitchen shall have not less than 50 sf of gross floor area.

**Minimum dimensions.** Except kitchens, habitable rooms shall not be less than 7 feet in any horizontal dimension.

**Height effect on room area.** Portions of a room with a sloping ceiling measuring less than 5 feet or a furred ceiling measuring less than 7 feet from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required habitable area for that room.

**CEILING HEIGHT****IRC R305**

**Minimum Height.** Habitable rooms, hallways, corridors, bathrooms, toilet rooms, and basements shall have a ceiling height of not less than 7 feet from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required habitable area for that room.

**Exceptions:**

1. Beams and girders spaced not less than 4 feet on center may project not more than 6 inches below the required ceiling height.
2. Not more than 50 percent of the required floor area of a room or space is permitted to have a sloped ceiling less than 7 feet in height with no portion of the required floor area less than 5 feet in height.

**SANITATION****IRC R306**

**Toilet facilities.** Every dwelling unit shall be provided with a water closet, lavatory, and a bathtub or shower.

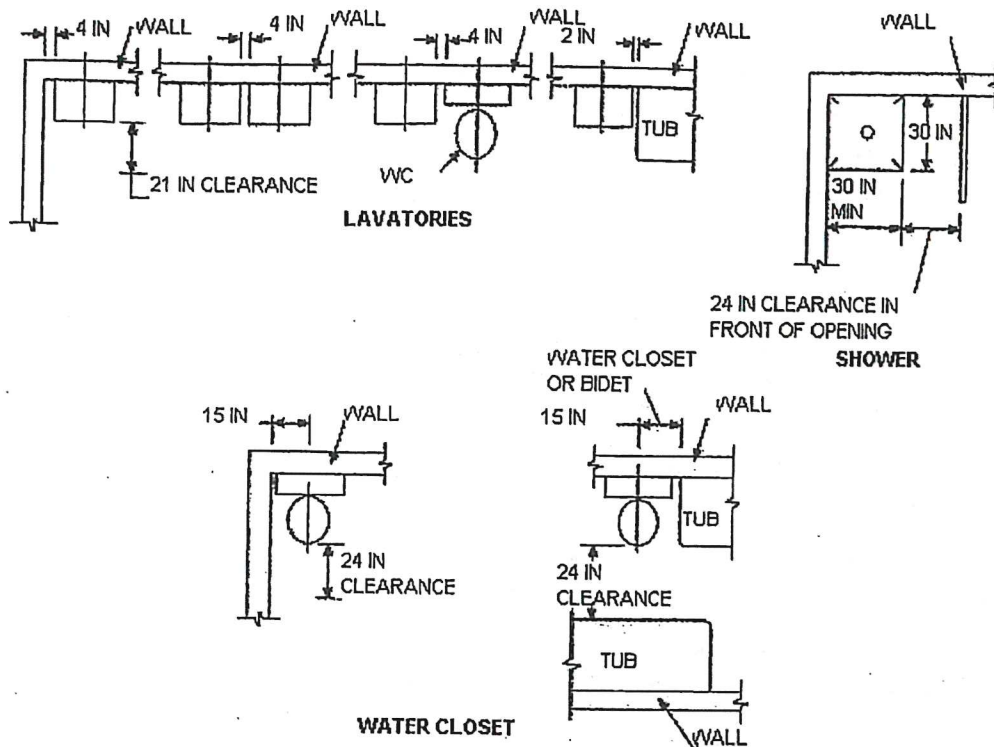
**Kitchen.** Each dwelling unit shall be provided with a kitchen area and every kitchen area shall be provided with a sink.

**Sewage disposal.** All plumbing fixtures shall be connected to a sanitary sewer or to an approved private sewage disposal system.

**Water supply to fixtures.** All plumbing fixtures shall be connected to an approved water supply. Kitchen sinks, lavatories, bathtubs, showers, bidets, laundry tubs and washing machine outlets shall be provided with hot and cold water.

**TOILET, BATH AND SHOWER SPACES IRC R307, MN Plumbing Code 4715.1220**

**Space required.** Fixtures shall be spaced in accordance with the following diagram:



**Bathtub and shower spaces.** Bathtub and shower floors and walls above bathtubs with installed showerheads and in shower compartments shall be finished with a nonabsorbent surface. Such wall surfaces shall extend to a height of not less than 6" above the floor.

#### SAFETY GLASS (GLAZING)

IRC R308

**Hazardous locations.** The following shall be considered specific hazardous locations for the purposes of glazing:

1. Glazing in swinging doors except jalousies.
2. Glazing in fixed and sliding panels of sliding door assemblies and panels in sliding and bi-fold closet door assemblies.
3. Glazing in storm doors.
4. Glazing in doors and enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers. Glazing in any part of a building wall enclosing these compartments where the bottom exposed edge of the glazing is less than 60" measured vertically above any standing or walking surface.
5. Glazing, in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24" arc of the door in a closed position and whose bottom edge is less than 60" above the floor or walking surface.

6. Glazing in an individual fixed or operable panel, other than those locations above, that meets all of the following conditions:
  - Exposed area of an individual pane greater than 9 sf.
  - Bottom edge less than 18" above the floor.
  - Top edge greater than 36" above the floor.
  - One or more walking surfaces within 36" horizontally of the glazing.
7. All glazing in railings, regardless of an area or height above a walking surface. Included are structural baluster panels and nonstructural in-fill panels.
8. Glazing in walls and fences enclosing indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60" above a walking surface and within 60" horizontally of the water's edge. This shall apply to single glazing and all panes in multiple glazing.
9. Glazing in walls enclosing stairway landings or within 60" of the top and bottom of stairways where the bottom edge of the glass is less than 60" above the walking surface.
10. Glazing adjacent to stairways, landings and ramps within 36 inches horizontally of a walking surface when the exposed surface of the glass is less than 60 inches above the plane of the adjacent walking surface.
11. Glazing adjacent to stairways within 60 inches horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glass is less than 60 inches above the nose of the tread.

**Identification.** Each pane of glazing installed in hazardous locations shall be provided with a manufacturer's or installer's label, designating the type and thickness of glass and the safety glazing standard with which it complies, which is visible in the final installation. The label shall be acid etched, sandblasted, ceramic-fired, embossed mark, or shall be of a type which once applied cannot be removed without being destroyed.

Requirements for glazing are addressed in the state building code. See 2006 International Residential Code Section R308 for complete requirements and exceptions.

#### **ATTACHED GARAGES AND CARPORTS                      IRC R309, SBC 1309.0309**

**Foundations.** See FOUNDATIONS section below.

**Opening protection.** Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 1 3/8" in thickness, solid or honeycomb core steel doors not less than 1 3/8" thick, or 20-minute fire-rated doors.

**Duct penetration.** Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. 26 gage sheet steel or other approved material and shall have no openings into the garage.

**Separation required.** The garage shall be separated from the residence and its attic area by not less than 1/2" gypsum board applied to the garage side. The separation is a floor-ceiling assembly; the structure supporting the separation shall also be protected by not less than 1/2" gypsum board or equivalent.

**Floors.** Garage floors may be concrete, asphalt, sand, gravel, crushed rock or natural earth. The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain. Concrete floor slabs in unheated garages can be moved by the affects of frost. Pour the garage floor separate from the foundation and place walls directly on the foundation to allow this movement to be independent so it does not affect other elements of the structure.



**Carports.** Carports shall be open on a least two sides. Carport floors may be concrete asphalt, sand, gravel, crushed rock or natural earth and asphalt surfaces shall be permitted at ground level. Carports not open on at least two sides shall be considered a garage and shall comply with the provisions of this section for garages.

## **EGRESS WINDOWS**

### **IRC R310, SBC 1309.0310**

**Emergency escape and rescue openings.** Basements and every sleeping room shall have at least one openable emergency escape and rescue window or exterior door opening for emergency escape and rescue. Where openings are provided as a means of escape and rescue, they shall have a sill height of not more than 44" above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure the bulkhead enclosure shall comply with Section 310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the window or door opening from the inside. Escape and rescue window openings with a finished sill height below the adjacent ground elevation shall be provided with a window well. A minimum ceiling height of 48" shall be maintained above the exterior grade from the exterior wall to a public way.

**Minimum opening area.** All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 sf, except grade floor openings shall have a minimum net clear opening of 5 sf.

**Minimum opening height and width.** The minimum net clear opening height shall be 24". The minimum net clear opening width shall be 20".

**Operational constraints.** Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools or special knowledge.

**Replacement windows.** Replacement windows installed in buildings meeting the scope of the International Residential Code shall be exempt from the requirements of Sections R310.1, R310.1.1, R310.1.2, and R310.1.3 if the replacement window meets the following conditions:

1. The replacement window is the manufacturer's largest standard size window that will fit within the existing frame or existing rough opening. The replacement window shall be permitted to be of the same operating style as the existing window or a style that provides for a greater window opening area than the existing window;
2. The rooms or areas are not used for any Minnesota state licensed purpose requiring an egress window; and
3. The window is not required to be replaced.

**Window wells.** Window wells required for emergency escape and rescue shall have horizontal dimensions that allow the door or window of the emergency escape and rescue opening to be fully opened. The horizontal dimensions of the window well shall provide a minimum net clear area of 9 sf with a minimum horizontal projection and width of 36". The required ladder or steps shall be permitted to encroach a maximum of 6" into the required dimensions of the window well. Footing depth below grade must be maintained at window well locations.

**Ladder and steps in window wells.** Window wells with a vertical depth greater than 44" below the adjacent ground level shall be equipped with a permanently affixed ladder or steps usable with the window in the full open position. Ladders or rungs shall have an inside width of at least 12", shall project at least 3" from the wall and shall be spaced not more than 18" on center vertically for the full height of the window well.

**Bulkhead enclosures.** Bulkhead enclosures shall provide direct access to the basement. The bulkhead enclosure with door panels in the fully open position shall provide the same minimum net clear opening required for egress windows.

**Bars, grills, covers and screens.** Bars, grills, covers, screens or similar devices are permitted to be placed over emergency escape and rescue openings, bulkhead enclosures, or window wells that serve such openings, provided the minimum net clear opening size equals that required for egress windows. Release or removal shall be from the inside and shall not require the use of a key or other tool, special knowledge or force greater than that which is required for normal operation of the escape and rescue opening.

## **EXITS**

### **IRC R311, SBC 1309.0311**

**Exit doors.** Not less than one exit door shall be provided from each dwelling unit. The required exit door shall provide direct access from the habitable portions of the dwelling to the exterior without requiring travel through a garage. All egress doors shall be readily openable from the side from which egress is to be made without the use of a key or special knowledge or effort. The required exit door shall be a side-hinged door not less than 3' in width and 6'-8" in height. Other exterior hinged or sliding doors shall not be required to comply with these minimum dimensions.

**Hallways.** The minimum width of a hallway shall be not less than 3'.

**Exit facilities.** Exterior exit balconies, stairs and similar exit facilities shall be positively anchored to the primary structure to resist both vertical and lateral forces. This attachment shall not be accomplished by use of toenails or nails subject to withdrawal.

## **LANDINGS**

**Landings at doors.** There shall be a floor or landing on each side of each exterior door. The floor or landing at a required exit door shall not be more than 1.5" lower than the top of the threshold, except the landing at an exterior doorway shall not be more than 7-3/4" below the top of the threshold, provided that the door, other than an exterior storm or screen door, does not swing over the exterior landing.

**Size.** The width of each landing shall not be less than the door served. Every landing shall have a minimum dimension of 36" measured in the direction of travel.

## **RAMPS**

### **IRC R316**

**Ramps** shall have a maximum slope of one unit vertical in 12 units horizontal. Handrails shall be provided on at least one side of all ramps exceeding a slope of one unit vertical in 12 units horizontal. A minimum 3' x 3' landing shall be provided at the top and bottom of ramps, where doors open onto ramps and where ramps change direction.

## **STAIRWAYS**

### **IRC R311.5**

**Stairways.** Stairways shall not be less than 36" in clear **width** at all points above the permitted handrail height and below the required headroom height. **Handrails** shall not project more than 4.5" on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31.5" where a handrail is installed on one side and 27" where handrails are provided on both sides. The maximum **riser height** shall be 7-3/4" and the minimum tread depth shall be 10". The riser height shall be measured vertically between leading edges of the adjacent treads. The **tread depth** shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The walking surface of treads and landings of a stairway shall be sloped no steeper than one unit vertical in 48 units horizontal (2%). The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8". The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8". Open riser are permitted, provided that the opening between treads does not permit the passage of a 4" dia. Sphere. The minimum **headroom** in all parts of the stairway shall not be less than 6'-8" measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform.

**Landings for stairways.** There shall be a floor or landing at the top and bottom of each stairway, except at the top of an interior flight of stairs, provided a door does not swing over the stairs.

**Requirements for winders, spiral stairs and circular stairways** are addressed in the state building code. See Minnesota State Building Code Section 1309.0311 for complete requirements.

**Stairway illumination.** All interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landings and treads. Interior stairways shall be provided with an artificial light source located in the immediate vicinity of each landing of the stairway. Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway. Exterior stairways providing access to a basement from the outside grade level shall be provided with an artificial light source located in the immediate vicinity of the bottom landing of the stairway. An artificial light source is not required at the top and bottom landing, provided an artificial light source is located directly over each stairway section. The control for activation of the required interior stairway lighting shall be accessible at the top and bottom of each stair without traversing any step of the stair. The illumination of exterior stairs shall be controlled from inside the dwelling unit.

**Under stair protection.** Enclosed accessible space under stairs shall have walls, under stair surface, and soffits protected on the enclosed side with ½" gypsum board.

## **HANDRAILS**

### **IRC R311.5.6**

**Handrails.** Handrails having minimum and maximum heights of 34" and 38", respectively, measured vertically from the nosing of the treads, shall be provided on a least one side of stairways. All required handrails shall be continuous the full length of the stairs with four or more risers from a point directly above the top riser of a flight to a point directly above the lowest riser of the flight. Ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1.5" between the wall and the handrail. Handrails may be interrupted by a newel post at a turn. The use of volute, turnout, or starting easing is allowed over the lowest tread. Design live load 200 lbs.

**Handrail grip size. R311.5.6.3 Handrail grip size.** All required handrails shall be of one of the following types or provide equivalent graspability.

1. Type I. Handrails with a circular cross section shall have an outside diameter of at least 1-1/4 inches and not greater than 2 inches. If the handrail is not circular it shall have a perimeter dimension of at least 4 inches and not greater than 6-1/4 inches with a maximum cross section of dimension of 2-1/4 inches.
2. Type II. Handrails with a perimeter greater than 6-1/4 inches shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾ inch measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch within 7/8 inch below the widest portion of the profile. This required depth shall continue for at least 3/8 inch to a level that is not less than 1-3/4 inches below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1-1/4 inches to a maximum of 2-3/4 inches. Edges shall have a minimum radius of 0.01 inches.

## **GUARDS**

### **IRC R312**

**Guards required.** Porches, balconies or raised floor surfaces located more than 30" above the floor or grade below shall have guards not less than 36" in height. Open sides of stairs with a total rise of more than 30" above the floor or grade below shall have guards not less than 34" in height measured vertically from the nosing of the treads. Design live load 200 lbs.

**Guard opening limitations.** Required guards on open sides of stairways, raised floor areas, balconies, and porches shall have intermediate rails or ornamental closures that do not allow passage of a sphere 4" diameter, except the triangular openings formed by the riser, tread, and bottom rail of a guard at the open side of a stairway are permitted to be of a size such that a 6" sphere cannot pass through. Openings for required guards on the sides of stair treads shall not allow a sphere 4-3/8 inches to pass through.

## **SMOKE ALARMS**

### **IRC R313, SBC 1309.0313**

**Single-and multiple-station smoke alarms.** Single-and multiple-station smoke alarms shall be installed in the following locations:

- In each sleeping room.
- Outside of each separate sleeping area in the immediate vicinity of the bedrooms.
- On each additional story of the dwelling, including basements and cellars but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

When more than one smoke alarm is required to be installed within an individual dwelling unit the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. All smoke alarms shall be listed and installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA72.

**Alterations, repairs or additions.** When interior alterations, repairs or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be provided with smoke alarms located as required for new dwellings; the smoke alarms shall be interconnected and hardwired. Smoke alarms in existing areas shall not be required to be interconnected and hardwired where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure. Smoke alarms are not required where work is on the exterior which does not require entry into the interior for inspection.

## **FOAM PLASTIC**

### **IRC R314, SBC 1309.0314**

*Spray foam insulation requires specific approval for each project for the proposed use. Technical data and test results shall be submitted for review by the Building Official at the time of building permit application.*

**Thermal barrier.** All foam plastic or foam plastic cores in manufactured assemblies used in building construction shall have a flame-spread rating of not more than 75 and shall have smoke-developed rating of not more than 450 and, except where otherwise noted, shall be separated from the interior of a building by minimum 1/2 inch gypsum board or an approved finish material equivalent to a thermal barrier.

**Attics and crawlspaces.** Within attics and crawlspaces where access is required by other sections of the code and entry is made only for service of utilities, foam plastics shall be protected against ignition by 1-1/2 inch thick mineral fiber insulation, 1/4 inch thick wood structural panels, 3/8 inch particleboard, 1/4 inch hardboard, 3/8 inch gypsum board, or corrosion-resistant steel having a base metal thickness of 0.016 inch.

**Foam plastic in the rim joist area.** Foam plastic shall be permitted to be spray-applied to a sill plate and header (rim joist) without thermal barrier if all of the following conditions exist:

- The maximum thickness of the foam plastic shall not exceed 5-1/2".
- The foam plastic shall have a flame spread index of 25 or less and an accompanying smoke developed index of 450 or less when tested in accordance with ASTM E84.

#### **VAPOR RETARDERS**

**IRC R318, R506, SBC 1309.0318, MN Rules Ch. 7670, MN Rules Ch. 7672**

**Vapor barriers.** In all above grade framed walls, floors, and roof/ceilings comprising elements of the building thermal envelope, a vapor retarder shall be installed on the war-in-winter side of the insulation. A 6-mil polyethylene or approved vapor retarder with joints lapped not less than 6 inches shall be placed between the concrete floor slab and the base course or the prepared sub-grade where no base course exists. The vapor retarder may be omitted from garages, utility buildings and other unheated accessory structures and from driveways, walks, patios and other flatwork not likely to be enclosed and heated at a later date.

#### **ENERGY CODE**

**MN Rules Ch. 7670, MN Rules Ch. 7672**

New detached one and two family dwellings must comply with the current Minnesota Energy Code.

A compliance form is enclosed in the building permit packet. Alternatively, ResCheck design and compliance software is available on-line at <http://www.energycodes.gov/rescheck/>.

#### **FOUNDATIONS**

**IRC CH.4, MN Rules Ch. 7670, MN Rules Ch. 7672**

**Plans.** Wall thickness, height of unbalanced backfill, soil classification, reinforcing and anchorage specification must be clearly shown on plans for all foundation types.

**Frost depth.** Minimum depth to bottom of footing in Duluth is 60".

**Anchorage.** The wood sole plate at exterior walls shall be anchored to the foundation with anchor bolts spaced max 6' o.c. Anchor bolts shall also be located within 12" from the ends of each plate section. Bolts shall be at least 1/2" in dia., shall extend a minimum of 7" into masonry or concrete and when installed in masonry shall be grouted in place with at least one inch of grout between the bolt and masonry. Anchor bolts shall align with required vertical reinforcing. Interior bearing wall sole plates on monolithic slab foundations shall be positively anchored with approved fasteners.

**Reinforcing bars** are concrete encased electrodes and must be grounded per NEC 250.50 and 250.52.

**Poured concrete foundations** must comply with the IRC Chapter 4 and SBC 1309 or be designed and plans stamped by a Minnesota licensed engineer.

**Masonry foundations** must comply with the IRC Chapter 4 and SBC 1309 or be designed and plans stamped by a Minnesota licensed engineer. Where masonry foundations are not waterproofed below grade, to minimize water intrusion into block cells which can freeze, expand and break the block, best practice is use of 3-hole block with all cores fully filled.

**Insulated concrete form (ICF) foundations** must comply with the IRC Chapter 4 and SBC 1309 or be designed and plans stamped by a Minnesota licensed engineer.

**Wood foundations** must be designed and plans stamped by a Minnesota licensed engineer unless a soils report is submitted by a geo-technical engineer classifying the soil and site conditions in which the foundation will be constructed within the limitations of the provisions of IRC Ch. 4. Design and complete plans, specifications and calculations required clearly showing compliance with IRC Ch. 4.

**Frost Protected shallow foundations** must comply with IRC Chapter 4 and SBC 1309 or be designed and plans stamped by a Minnesota licensed engineer.

**Soils** are a component of the design of any foundation. Soils in Duluth typically do not fall within the prescriptive provisions set forth in the referenced codes. The result of this fact is that either an engineer must design foundations or a soil correction must be made. Soil must be addressed on plans. If a soil correction is to be made, a specification must be noted on construction documents.

**Waterproofing.** Basements must be waterproofed as required in R406. Any product proposed that is not prescribed in this section must be approved and must be specified on construction documents.

**Surface drainage.** Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection so as to not create a hazard. Lots shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6 inches within the first 10 feet.

**Foundation drainage.** Foundation drainage is required below the floor on both sides of footings. Perforated pipe on minimum 2" washed gravel or crushed rock larger than pipe openings and covered with 6" of the same material. Discharge must be to daylight or a sump. Install weepers through upper 1/2 of footing to allow flow to interior drain.

**Exterior foam insulation** must be protected above grade and to 6" below grade.

## **FLOORS**

### **R506**

**Concrete floors.** A vapor barrier is required under concrete floors except in unheated structures. Fill material shall be free of vegetation and foreign material, compacted to ensure uniform support and shall not exceed 24" for clean sand or gravel and 8" for earth. A 4" thick base course of clean graded sand, gravel or crushed stone shall be placed on the prepared sub-grade when the slab is below grade.

**Under-floor space.** Ventilation is required with min net openings of one sf per 150 sf of under floor area. The ventilation may not be required in some circumstances in accordance with IRC R408.3. An access opening is required min. 16" x 24" with a 16" x 24" areaway at the interior of the access.

**Floor framing plans** must be submitted with construction documents for plan review. Where engineered lumber products are to be used, engineered plans must be submitted.

## **WALLS**

### **IRC Chapter 6 and 7, MN Energy Code**

**Plans.** A wall section must be submitted with construction documents depicting all components of the proposed wall assembly.

## **FLASHING**

### **R703.8**

Approved corrosion-resistive flashing shall be provided in the exterior wall envelope in such a manner as to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. The flashing shall extend to the surface of the exterior wall finish and shall be installed to prevent water from reentering the exterior wall envelope. Flashing shall be installed in the locations required in R703.8.

Window and door flashing shall be according to manufacturer's instructions. Instructions shall be available on job site for inspectors. Pan flashing is required at all exterior windows and doors unless another flashing method is provided by the product manufacturer.

## DECKS

Deck informational packet is available in the Town of Thomson office.

**Permit required** for decks attached to a structure or any deck more than 30 inches above grade. Application and submittal requirements available in the Town of Thomson office.

**Setback requirements.** Always site specific. Check with the Town of Thomson office for your project.

**Decking material.** Heartwood or sapwood from redwood, cedar or other decay and termite resistant wood or treated wood is required. Use 1" decking if joists are at 16" o.c. or less. Use 2" if joists are more than 16" o.c.

**Wood.** Exposed wood must be of heartwood or sapwood from redwood, cedar or other decay and termite resistant wood or treated wood.

**Fasteners and connections.** Some treated wood requires stainless steel fasteners, hangers, and connectors.

**Ledger.** Same size as joists. Install lag screws that penetrate 1-1/2" minimum into rim joist or wall studs. A minimum of two 3/8 inch lag screws every 16 inches. Joist hangers must be correct size for joist size used.

Connections between deck and dwelling shall be weatherproof. Cuts in exterior finish shall be flashed.

**Joists.** See *JOIST SPAN* table for minimum joist size and spacing requirements. Ask your lumber supplier about species and grade.

**Beams.** See *BEAM AND FOOTING SIZES* table for beam size and spacing requirements. Any splices in beam must be over a support. Beams of 2 or more members shall be nailed together with 2 rows of 16d nails at 16" o.c.. Ask your lumber supplier about wood species and grade.

**Post size.** 3-1/2 inch minimum, depending on method of beam connection.

**Cantilevers.** Joists should not overhang beams by more than 2 feet, nor should beams over hang joists by more than one foot unless a special design is approved.

**Footings.** See *BEAM AND FOOTING SIZES* table for footing size and spacing requirements. Minimum thickness of footing pad is 8 inches but thicker required for larger footings (See Chart). Minimum depth to bottom of footing is 5 feet. Reinforcing of footing pad may be recommended.

**Columns (piers, pilasters).** Minimum diameter is 8 inches. Post connection by pin or approved fastener. Reinforcing may be recommended.

**Guardrails.** Required where deck floor height above grade is 30 inches or more. Minimum guardrail height for decks accessory to one or two family dwellings is 36 inches. Minimum guardrail height for decks accessory to other dwellings is 42 inches. Distance between bottom of guardrail and deck floor must be less than 4 inches. Where guardrail is adjacent to a stair, a sphere 6 inches in diameter may not pass through the triangular opening created by the guardrail, riser and tread. Balusters must be spaced less than 4 inches apart.

**Handrails.** At least one handrail is required where stairs have more than 3 risers. Height must be 34 to 38 inches above the nosing of the tread. Ends must be returned or terminate in posts. Handgrips shall be between 1-1/4 and 2 inches in cross section or have an equivalent gripping surface and shall have a smooth surface with no sharp corners.

**Stair width.** Minimum is 36 inches.

**Riser height.** Maximum 7-3/4 inches for stairs accessory to one or two family dwellings. MN SBC requirements address other dwellings. Openings in risers between treads shall be less than 4 inches.

**Tread depth.** Minimum 10 inches for stairs accessory to one or two family dwellings and townhomes. MN SBC requirements address dwellings outside the scope of the IRC and Chapter 1309.

**Landing size.** Minimum 3 feet x 3 feet required at egress door and at the bottom of the stair. Where required, the landing may not be more than 7-3/4 inches below top of threshold.

## DETACHED GARAGES.

Garage informational packet is available with complete application and instructions in the Town of Thomson office.



## MINNESOTA DEPARTMENT OF LABOR & INDUSTRY

Department of Labor and Industry  
Construction Codes and Licensing Division  
443 Lafayette Road N.  
St. Paul, MN 55155  
Phone: (651) 284-5012 or 1-800-657-3944  
TTY: (651) 297-4198 Fax: (651) 284-5749

The State of Minnesota adopts a set of construction standards known as the Minnesota State Building Codes (MSBC). The MSBC contains safety requirements relating to structure, mechanical, plumbing, energy, electrical, elevators, manufactured buildings and life safety.

The information in this brochure is for general reference for residential construction projects. Contact your municipal building official regarding permits and specific code requirements for residential construction within your community.

### To confirm if your contractor is licensed in Minnesota contact the:

Department of Labor and Industry  
Residential Building Contractors  
Phone: (651) 284-5069 or 1-800-657-3944  
[www.doli.state.mn.us/contractor.html](http://www.doli.state.mn.us/contractor.html)  
E-mail: [DLI.Contractors@state.mn.us](mailto:DLI.Contractors@state.mn.us)

[www.doli.state.mn.us](http://www.doli.state.mn.us)  
[www.mncodes.org](http://www.mncodes.org)

05-07



**Gopher State One Call**  
Call at least two full business days before you dig.  
Phone: 811 or (651) 454-0002  
[www.call811.com](http://www.call811.com)



## EMERGENCY ESCAPES

*Guidelines for planning emergency escape windows and window wells*



Thousands of fires occur in residences each year. Many of these fires occur at night when the occupants are asleep. Severe injuries or death can be the result of these fires if the occupants are asleep and unaware the fire is in progress. Death usually results from asphyxiation long before the fire reaches the occupants.

In order to prevent the loss of life, the Minnesota State Building Code requires smoke alarms to be installed in dwellings to alert the occupants of a fire.

The code also has emergency escape and rescue opening requirements for sleeping rooms. Dwelling units are required to have windows or doors that may be used for emergency escape or rescue including basements. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement.

The size of windows and doors required in the code are based on extensive research to determine the proper relationships of height and width of window openings to adequately serve for both rescue and escape.

Emergency escape and rescue openings shall open directly into a public way, or to a yard or court that opens to a public way, so the occupants may escape or be rescued directly from the room to the outside without having to travel through the building itself.

When a fire occurs, time is critical to survival. There may not be enough time to instruct family members and guests about the proper window operation or to perform complex operations to get the window open. The code requires windows and doors used for emergency escape or rescue to be readily openable without any special knowledge or effort. This means that no window sashes may be lilted or removed to obtain the required open area, width or height. Local building officials can be consulted to assist in the evaluation of special types of windows.



When a fire occurs, time is critical to survival. So, the Minnesota State Building Code features emergency escape opening requirements. Sleeping rooms require windows and doors that can be readily opened without any special knowledge or effort. Rescuers need public access to a building and space to enter quickly, possibly wearing extra gear. Everyone should know what a smoke alarm sounds like and practice how to safely escape. An emergency escape plan should include a test of the smoke alarm and a safe place to meet such as a mailbox or sidewalk.

Construction Codes and Licensing





The 2007 Minnesota State Building Code adopts the 2006 International Residential Code (2006 IRC). All "R" code references provided in this brochure pertain to the 2006 IRC.

**Emergency escape and rescue openings**

Basements and every sleeping room shall have at least one operable emergency and rescue opening. Such opening shall open directly into a public street, public alley, yard or court. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Where emergency escape and rescue openings are provided, they shall have a sill height of not more than 44 inches (1118 mm) above the floor. When a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with R310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with R310.2. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court that opens to a public way (R310.1).

Exception: Basements used only to house mechanical equipment and not exceeding total floor area of 200 square feet (18.58 m<sup>2</sup>).

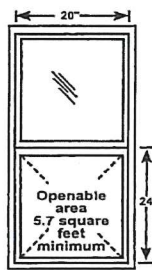
All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet (0.530 m<sup>2</sup>) (R310.1).

Exception: Grade floor openings shall have a minimum net clear opening of 5 square feet (0.465 m<sup>2</sup>).

A window with an opening that meets the minimum width and height will not necessarily meet the minimum required open area. The minimum net clear opening height shall be 24 inches (610 mm) (R310.1.2).

The minimum net clear opening width shall be 20 inches (508 mm) (R310.1.3).

Right: An illustration of an emergency escape and rescue window meeting the minimum requirements (20' x 41.04' / 144' = 5.7 square feet minimum net openable area).



Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools or special knowledge (R319.1.4).

The minimum horizontal area of the window well shall be 9 square feet (0.9 m<sup>2</sup>), with a minimum horizontal projection and width of 36 inches (914 mm). The area of the window well shall allow the emergency escape and rescue opening to be fully opened (R310.2).

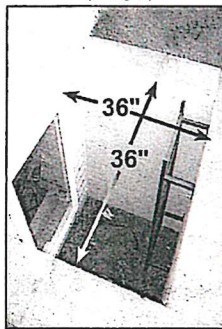
Exception: The ladder or steps required by R310.2.1 shall be permitted to encroach a maximum of 6 inches (152 mm) into the required dimensions of the window well.

Window wells with a vertical depth greater than 44 inches (1118 mm) shall be equipped with a permanently affixed ladder or steps usable with the window in a fully open position. Ladders or steps required by this section shall not be required to comply with sections R311.5 and R311.6. Ladders or rungs shall have an inside width of at least 12 inches (305 mm) on center vertically for the full height of the window well (R310.2.1).

Bulkhead enclosures shall provide direct access to the basement. The bulkhead enclosure with the door panels in the fully open position shall provide the minimum net clear opening required by R310.1.1. Bulkhead enclosures shall also comply with R311.5.8.2 (R310.3).

Bars, grilles, covers, screens or similar devices are permitted to be placed over emergency escape and rescue openings, bulkhead enclosures or window wells that serve such openings, provided the minimum net clear opening size complies with sections R310.1.1 to R310.1.3, and such devices shall be releasable or removable from the inside without the use of a key, tool, special knowledge or force greater than that which is required for normal operation of the escape and rescue opening (R310.4).

Emergency escape windows are allowed to be installed under decks and porches provided the location of the deck allows the emergency escape window to be fully opened and provides a path not less than 36 inches (914 mm) in height to a yard or court (R310.5).



Replacement windows installed in buildings meeting the scope of the International Residential Code shall be exempt from the requirements of Sections R310.1, R310.1.1, R310.1.2, and R310.1.3 if the replacement window meets the following conditions:

1. The replacement window is the manufacturer's largest standard size window that will fit within the existing window frame or existing rough opening. The replacement window shall be permitted to be the same operating style as the existing window or a style that provides for a greater window opening area than the existing window.
2. The rooms or areas are not used for any Minnesota state licensed purpose requiring an egress window; and
3. The window is not required to be replaced pursuant to a locally adopted rental housing, or rental licensing code (R310.1.5).

**A special note regarding guards around windows**

The Minnesota State Building Code does not specify requirements for guards around window wells to keep persons from falling into them, falls can and do occur. Because of the variations in the size, location and depth of window wells and since a guard could present an impediment to escape or rescue, the code is silent. The potential for falls into a window well should be evaluated by the homeowner and suitable guards or visual barriers provided based on the location, depth and size of the well. Barriers, guards or covers installed to prevent falls must be placed in such a way that does not impede use of the window well for escape and rescue. If covers are used, the effects of snow on the ability to open or remove them in an emergency must also be evaluated.

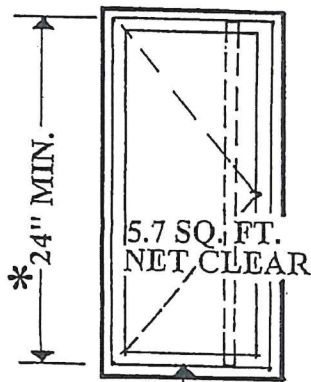
The ever-increasing concern for security, particularly in residential buildings has created a fairly large demand for security devices such as grilles, bars and steel shutters. Unless properly designed and constructed, these security devices over emergency windows can completely defeat the purpose of the emergency escape and rescue window. The code makes provisions for use of security devices, provided the release mechanism has been approved by the building official and it is operable from the inside without the use of a key or special knowledge.

Fire deaths have been attributed to the inability of the individual to escape from the building because the security bars prevented emergency escape. Security devices should only be installed where absolutely necessary and only with a permit after an evaluation by your local building and fire official.

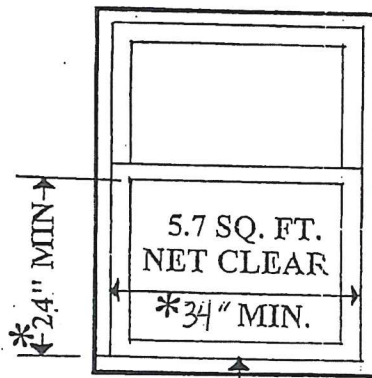
# ESCAPE AND RESCUE WINDOWS



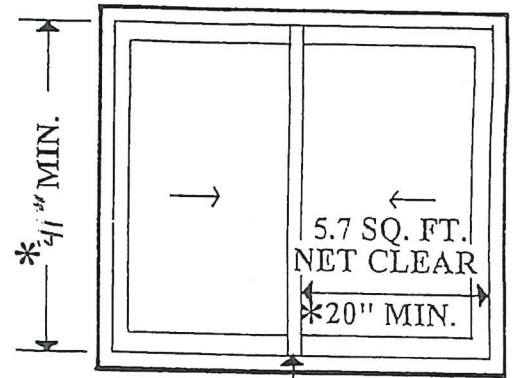
CASEMENT



DOUBLE HUNG



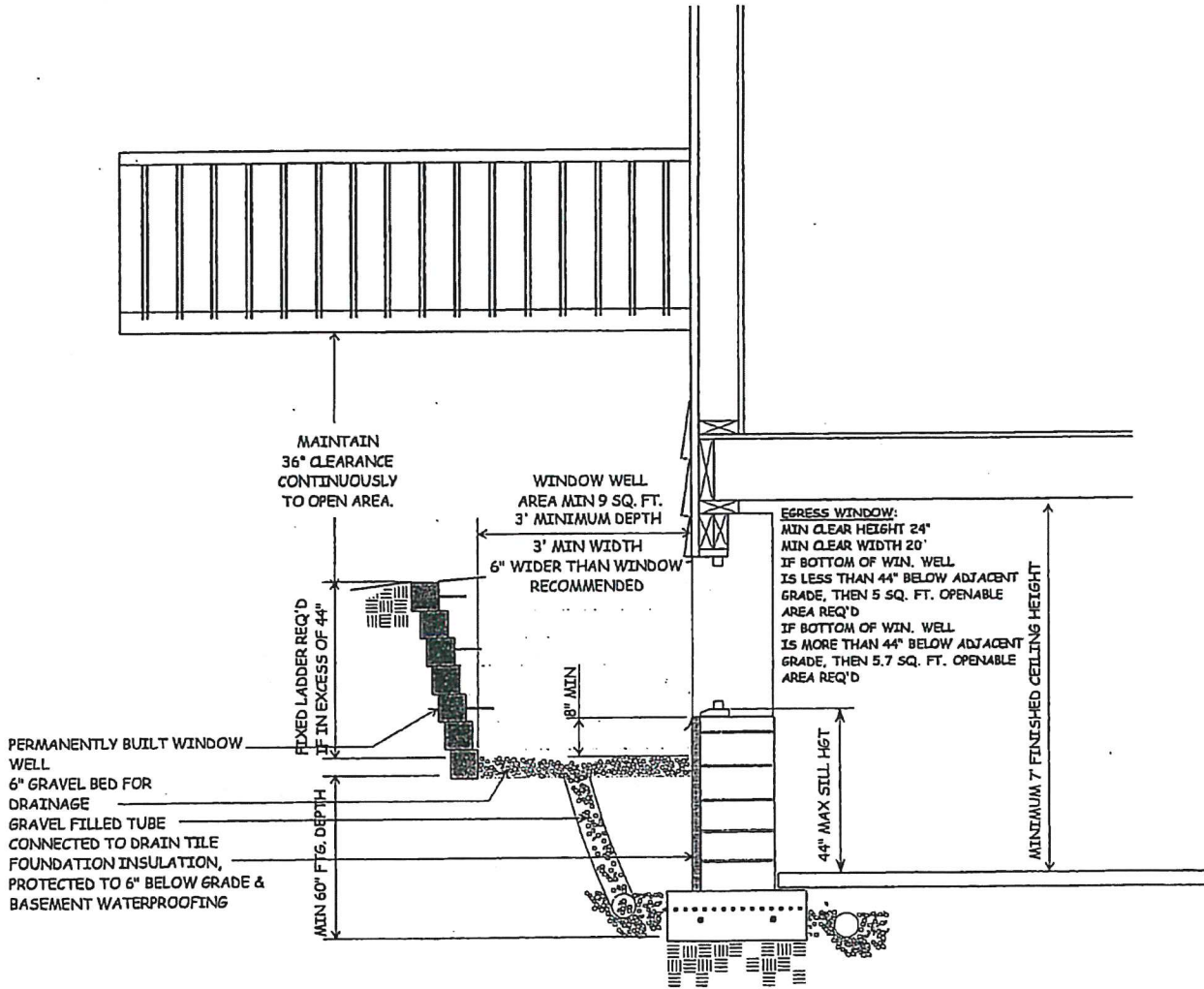
SLIDE BY



MAXIMUM OF 44 INCHES MEASURED FROM FLOOR TO HIGHEST PORTION OF SILL

\*\*\*PLEASE NOTE THAT THE 20" AND 24" DIMENSIONS ARE THE MINIMUMS EACH WAY, AND THAT YOUR NET CLEAR OPENING MUST BE 5.7 SQ. FT. EXAMPLE: IF YOUR OPENING WIDTH IS AT THE 20" MINIMUM, YOU WILL NEED A CLEAR OPENING HEIGHT OF 41" TO ARRIVE AT THE MINIMUM NET CLEAR OPENING OF 5.7 SQ. FT. ( $3.42' \times 1.66' = 5.7$ )

# Window Wells 2007



## NOTE

Depth to bottom of footing for new homes shall be a minimum of 60".  
Drop footings may be required.

Where 60" depth to bottom of footing cannot be achieved due to existing conditions, frost protection must be accomplished using 2" rigid foam insulation under the gravel bed extending horizontally from the foundation wall to the outer wall of the window well.