BARNDOMINIUMS/SHOUSES and the 2020 MINNESOTA RESIDENTIAL CODE

Minnesota Department of Labor and Industry

What are barndominiums and shouses?

"Barndominium" and "shouse" are terms used to describe dwellings with attached shops or storage areas and usually built using a post frame method of construction.

These structures often have metal panel roofing and siding that is associated with barns and storage buildings. Unlike conventional "stick-built" homes that require a foundation and footing around the entire perimeter of the home, post frame structures often require a post and footing placed every six to eight feet.

Example of a barndominium/shouse.

Are barndominiums and shouses required to comply with the 2020 Minnesota Residential Code?

Yes. Barndominiums and shouses are considered single-family dwellings and classified as an IRC-1 occupancy group. These structures must be designed and constructed in accordance with the 2020 Minnesota Residential Code (2020 MNRC) provisions. [R300.1, R301.1]

Do barndominium and shouse requirements apply for all of Minnesota?

Yes. The Minnesota State Building Code is the standard of construction for the entire state of Minnesota, whether local code enforcement exists or not. The 2020 MNRC adopts the 2018 International Residential Code (IRC) with amendments. [Minnesota Statutes, section 326B.121, Minnesota Rules 1309]

For the purposes of this fact sheet, "code" means the Minnesota State Building Code adopted under Minnesota Statutes, section 326B.106, subdivision 1, and includes the chapters identified in Minnesota Rules, chapter part 1300.0020. The 2020 MNRC can be viewed at https://codes.iccsafe.org/content/MNRC2020P1.

Are building permits required for all barndominiums and shouses?

Yes. Although barndominiums and shouses are constructed with the appearance of an agricultural building, their intended use is a dwelling and building permits are required for inspections and to verify code compliance.

Is a Minnesota residential building contractor license required to build a barndominium or shouse?

Yes. A Minnesota residential building contractor license is required for the construction of a barndominium or shouse because they are residential dwellings. Licensed contractors and homeowners should confirm with the local jurisdiction requirements for permits, inspections, zoning, and other relevant regulations before construction. [Minn. Stat. 326B.805 and 326B.802 subd. 13]

Are barndominium and shouse setbacks from property lines regulated by the code?

No. The 2020 MNRC does not address minimum property line setback requirements for a barndominium or shouse. Local zoning ordinances may regulate property line setbacks and land use for all dwellings, including barndominiums and shouses. Local zoning ordinances may also limit the use of metal exterior finishes and should be verified.

Does the code have requirements for exterior walls and eave projections near property lines?

Yes. Barndominiums and shouses must comply with code requirements for exterior walls. Barndominium or shouse exterior walls that are less than five feet from the property line are required to be one-hour fire-resistive rated. Roof eave

projections that are two feet or more and less than five feet from the property line must also be one-hour fire-resistive rated. (See illustration at right.) [R302.1, Table R302.1(1), Minn. R. 1300.0120 Subp. 4]

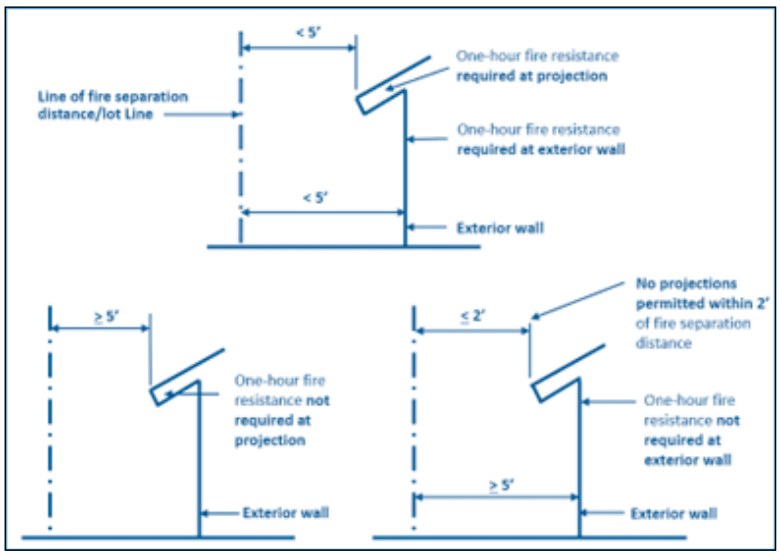


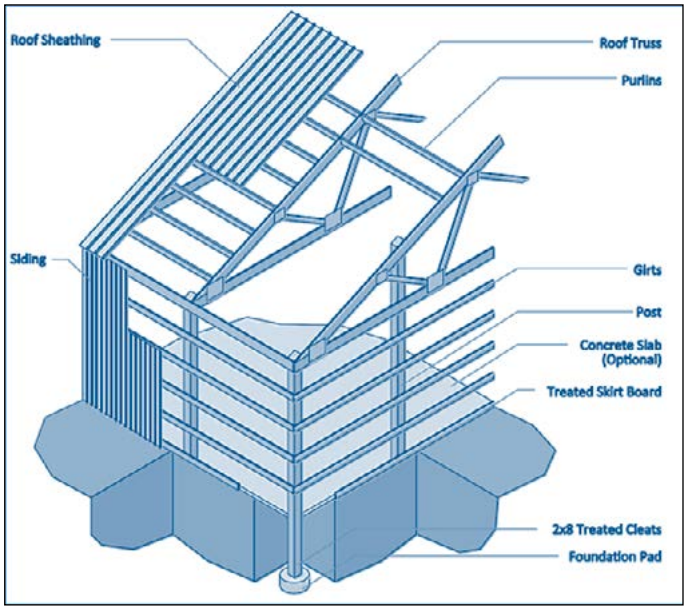
Table R302.1(1) – Exterior walls (without fire sprinklers)

Does the 2020 MNRC provide design requirements for post/frame construction?

No. The 2020 MNRC provides the minimum prescriptive requirements for conventional light frame construction. A post frame structure could be accepted as an alternate method of construction if approved by the building official. Documentation must be submitted to the building official to demonstrate that the alternate method complies with the intent of the code. [R301.1.2, R301.1.3, Minn. R. 1300.0110 subp. 13]

Is a structural engineer required to design a barndominiums and shouses?

Yes. Design by a structural engineer is required for any structural elements (design, foundation system, method of anchorage) of a dwelling that do not comply with the 2020 MNRC requirements for conventional light frame construction. Barndominiums and shouses are generally post frame construction which is not considered light frame construction or addressed by the code so a structural engineer must certify the design as compliant with the code. [R301.1.3]



Typical post/frame components.

Are barndominiums and shouses required to have footings and foundations complying with the code?

Yes. A foundation system of post and footings, slab-on-grade, or another foundation type must be capable of supporting all imposed loads regulated by the code. This is necessary because all structures must be constructed to support the loads (i.e., dead loads, live loads, roof loads, snow loads, wind loads …) as prescribed by the code, which results in a system providing a complete load path to transfer loads from their point of origin through the foundation to the supporting soils. [R301.1, R401.2]

Do barndominiums and shouses require frost depth footings?

The footings of all dwellings must be frost protected in accordance with the code. Barndominiums and shouse often include posts with footings, slab-on-grade, or conventional foundation methods of construction The 2020 MNRC permits five options for frost footings, including compliance with Minn. R. 1303.1600. Minn. R. 1303.1600 provides the minimum footing depths for frost protection in Minnesota counties and requirements for slab on grade structures. The minimum frost protection depths are 42 inches in southern counties or 60 inches in northern ones. [R403.1.4.1, Minn. R. 1303.1600]

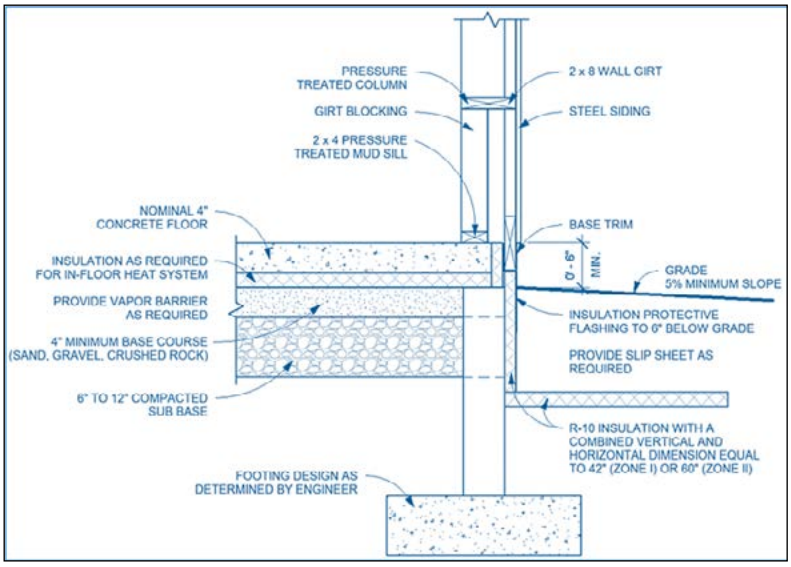
Are barndominiums and shouses required to comply with energy code requirements like other dwellings?

Yes. Barndominiums and shouses must comply with the minimum requirements of the Minnesota Residential Energy Code (MNREC) because they are considered single-family dwellings. Construction plans and documents for

a barndominium or shouse must include the information required by the MNREC and other information as requested by the building official to verify compliance with the MNREC. [Minn. R. 1322, 1322.0103, 1300.0130]

Are there requirements for the slab-on-grade portion of a barndominium or shouse?

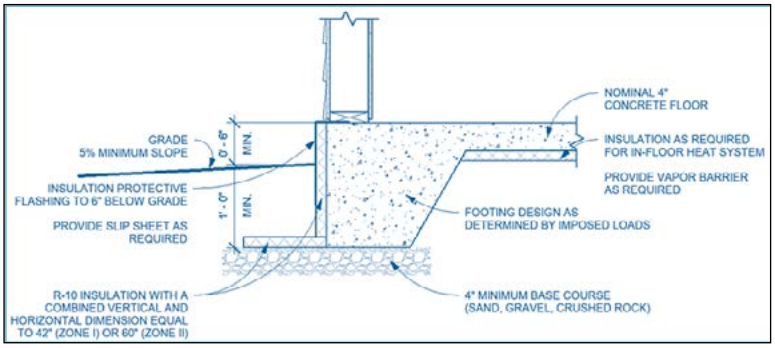
Yes. Slab-on-grade construction must comply with the MNRC and MNREC. Slab-on-grade insulation must meet the MNREC requirements for minimum R-values and requirements for the climate zone (6A or 7) where the structure will be located. The slab-on-grade required insulation depth can be a total of the combined vertical and horizontal insulation dimensions. (See illustration) [MNRC R403, Minn. R. 1322, MNREC R402.2.9 and MNREC Table R402.1.1]



Example of slab-on-grade insulation for post frame.

Do post frame barndominiums and shouses require radon control systems?

Yes. A radon control system that complies with Minn. R. 1303.2400 is required for residential dwellings with floor systems in contact with the earth such as slab-on-grade floors. The radon control system is only required for the dwelling area and not the attached garage, shop or storage area.



Example of slab-on-grade insulation.

Is a fire separation required barndominium or shouse between the dwelling and garage, shop or storage areas?

Yes. The code requires ½-inch gypsum board at the common wall between the house and garage of conventional dwelling construction. The same requirement applies to barndominiums and shouses with attached garages or attached storage and shop areas with overhead garage doors for vehicle access that could be used as a garage. Code requirements for openings in the common wall for fire separation also apply. [R302.5, R302.6]

Can metal siding panels be used as the required fire separation between the dwelling and garage or shop?

Unlikely. The code requires ½-inch gypsum board at the common wall between the house and garage of conventional dwelling construction. The metal siding could be used if installed over the 1/2-inch gypsum board that provides fire protection. The metal siding could be approved as an alternate method of construction if it is proven to meet the intent of the code and provides fire protection equivalent to ½-inch gypsum board. Metal panel siding may be noncombustible but does not function the same as gypsum board in a fire event. [R302.5, R302.6]

Are there requirements for doors, openings and penetrations between the dwelling portion and garage, shop?

Yes. There are several requirements. Openings between the garage or shop directly into a room used for sleeping purposes is prohibited. Other openings between the garage or shop and dwelling shall be equipped with solid wood doors not less than 13/8 inches in thickness, solid or honeycomb core steel doors not less than 13/8 inches thick, or 20-minute fire-rated doors. Other penetrations or openings shall be protected as required by the code. [R302.5, R302.5.1]

Can a second floor or loft in the dwelling have doors or windows overlooking the garage or shop area?

Window openings between the garage or shop and dwelling are prohibited. Other penetrations or openings, such as doors, between the garage or shop and dwelling must be protected as discussed above. [R302.5, R302.5.1]

Is the exterior siding or other cladding required to have 6 inches of clearance above the ground?

Exterior siding or other cladding must comply with the MNRC. Wood siding, wood sheathing and wall framing on the exterior of the structure must have a minimum of 6 inches of clearance to grade or decay protected by use of naturally durable or preservative treated wood. Metal panel siding must comply with the manufacturer's installation instructions and may require 6-inch to 8-inch clearance to grade to protect it from rusting. [R317.1, R317.1.2]

Example of a barndominium/shouse.

Does a post frame structure with metal panel siding require diagonal wall bracing for lateral building support?

Metal panel siding products may provide a structure with sufficient lateral support to meet wind load design requirements. The structure engineer is responsible for the designing the entire structure and certifying that the design is compliant with the code. [R301.1.3, R601.2]

Are barndominiums and shouses required to have a water-resistive barrier (WRB) at exterior wall assemblies?

Yes. The code requires all heated and unheated structures with exterior wall sheathing to have WRB. The WRB is placed over the exterior wall sheathing prior to installation of the exterior cladding (siding) to prevent water accumulation within the wall assembly. Post frame construction is required to have a WRB or be provided with a secondary drainage plane to drain any moisture to the structure's exterior. Alternative methods for a secondary drainage plane that demonstrate compliance with the intent of the code are permitted with the approval of the building official of the jurisdiction. [R703.2, R703.1.1, Minn. R. 1300.0110 subp. 13]

Are barndominiums and shouses required to have an ice barrier installed for roof covering materials?

Barndominiums and shouses are single-family dwellings and must comply with code requirements for those structures. Ice barriers are required as specified in the code for each type of roof covering material and the manufacturer's installation instructions. [R905.1, R905.1.2]

Instead of buying wood trusses for a barndominiums and shouses, can an individual fabricate their own?

Wood trusses are engineered components of the roof and ceiling assembly and must be designed by a Minnesota-licensed engineer to accepted engineering standards. The 2020 MNRC permits the use of wood trusses or the hand framing of a structurally compliant roof and ceiling assembly in accordance with prescriptive requirements for ridge boards, rafters and ceiling joists. The engineer is responsible for the entire structural design including the foundation system, roof system, and wall framing for all imposed load requirements. [R802.10 R802.3, R802.4, R802.5]