DEPARTMENT OF LABOR AND INDUSTRY

CCP-STR-1
5/28/24
9/3/24

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

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Firm/Association affiliation, if any: DLI/CCLD

Date: 5/28/2024, Rev 9/3/24

Model Code: N/A

Code or Rule Section: MR 1303.1600, Subp. 1

Topic of proposal: Footing Depth for Frost Protection.

Code or rule section to be changed: **1303.1600, Subpart 1 Footing Depth for Frost Protection.**

Intended for Technical Advisory Group ("TAG"):

General Information	**Yes**	**No**
A. Is the proposed change unique to the State of Minnesota?	☒	☐
B. Is the proposed change required due to climatic conditions of Minnesota?	☐	☒
C. Will the proposed change encourage more uniform enforcement?	☒	☐
D. Will the proposed change remedy a problem?	☒	☐
E. Does the proposal delete a current Minnesota Rule, chapter amendment?	☐	☒
F. Would this proposed change be appropriate through the ICC code development process?	☐	☒

Proposed Language

1. The proposed code change is meant to:

   ☐ change language contained the model code book? If so, list section(s).

   ☒ change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).
   1303.1600, Subp. 1 Footing Depth for Frost Protection

   ☐ delete language contained in the model code book? If so, list section(s).

   ☐ delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

   ☐ add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.

1303.1600 FOOTING DEPTH FOR FROST PROTECTION.

Subpart 1. **Minimum footing depth.** In the absence of a determination by an engineer competent in soil mechanics, the minimum allowable footing depth in feet ~~due to freezing~~ for frost protection is 48 inches ~~five feet~~ in Zone I, 60 inches in Zone II, and 72 inches in Zone III ~~3-1/2 feet in Zone II~~.

Zone I ~~shall~~ includes the counties of:

~~Aitkin,~~ Anoka, ~~Becker, Beltrami,~~ Benton, Big Stone, Blue Earth, Brown, ~~Carlton,~~ Carver, ~~Cass,~~ Chippewa, Chisago, ~~Clay, Clearwater, Cook,~~ Cottonwood, ~~Crow Wing,~~ Dakota, Dodge, ~~Douglas,~~ Faribault, Fillmore, Freeborn, Goodhue, ~~Grant,~~ Hennepin, Houston, ~~Hubbard,~~ Isanti, ~~Itasca,~~ Jackson, Kanabec, Kandiyohi, ~~Kittson, Koochiching,~~ Lac qui Parle, ~~Lake of the Woods, Lake,~~ Le Sueur, Lincoln, Lyon, ~~Mahnomen, Marshall,~~ Martin, McLeod, Meeker, Mille Lacs, ~~Morrison,~~ Mower, Murray, Nicollet, Nobles, ~~Norman,~~ Olmsted, ~~Otter Tail, Pennington,~~ Pine, Pipestone, ~~Polk,~~ Ramsey, ~~Red Lake,~~ Redwood, Renville, Rice, Rock, ~~Roseau,~~ Scott, Sherburne, Sibley, ~~St. Louis,~~ Stearns, Steele, Swift, Wabasha, Waseca, Washington, Watonwan, Winona, Wright, and Yellow Medicine.

Zone II ~~shall~~ includes the counties of:

Aitkin, ~~Anoka, Big Stone, Blue Earth, Brown,~~ Carlton, ~~Carver,~~ Cass, ~~Chippewa, Chisago,~~ Clay, Cook, ~~Cottonwood,~~ Crow Wing, ~~Dakota, Dodge,~~ Douglas, ~~Faribault, Fillmore, Freeborn, Goodhue,~~ Grant, ~~Hennepin, Houston,~~ Hubbard, ~~Isanti,~~ Itasca, ~~Jackson, Kandiyohi, Lac qui Parle,~~ Lake, ~~Le Sueur, Lincoln, Lyon, Martin, McLeod, Meeker,~~ Morrison, ~~Mower, Murray, Nicollet, Nobles, Olmsted,~~ Otter Tail, ~~Pipestone,~~ Pope, ~~Ramsey, Redwood, Renville, Rice, Rock,~~ St. Louis (South of a line connecting the eastern and western St. Louis County borders via highways MN-169 to MN-116 to MN-23), ~~Scott, Sherburne, Sibley, Stearns, Steele,~~ Stevens, ~~Swift,~~ Todd, Traverse, ~~Wabasha,~~ Wadena, ~~Waseca, Washington, Watonwan,~~ and Wilkin~~, Winona, Wright, Yellow Medicine~~.

Zone III includes the counties of:

Becker, Beltrami, Clearwater, Kittson, Koochiching, Lake of the Woods, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake, Roseau, and St. Louis (North of a line connecting the eastern and western St. Louis County borders via highways MN-169 to MN-116 to MN-23).

Exceptions:

1. For heated and semi-heated buildings and spaces maintained at a minimum of 41 degrees F and provided with energy code compliant foundation and building envelope insulation, the minimum allowable footing depth due to freezing is 36 inches in Zone I; 48 inches in Zone II; and 60 inches in Zone III.
2. When a fully enclosed unheated attached garage, porch, or similar space shares at least 20% of its perimeter wall area with a heated space, and when provided with energy code compliant foundation and building envelope insulation as required for heated spaces, the minimum allowable footing depth for frost protection may match those as indicated in Exception 1.

~~Less~~ Shallower depths may be permitted when supporting evidence is presented by an engineer competent in soil mechanics.

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts. No, N/A

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)

   The frost depth data currently used is not grounded in climate data or current frost depth data. Frost depth data available is developed by MNDoT and is not specific to heated buildings. Use of the ASCE (American Society of Civil Engineers) 32-01 Standard for Frost Protected Shallow Foundations to calculate foundation depths is an allowable design method within the current code.

   Air Freezing Index data collected from 1951-1980 is already in the ASCE 32 Standard. New climate data for Air Freezing Index collected from 1981-2010 can reasonably be incorporated into the older data set to create a new average, leveraging 60 years of data in lieu of only 30 years of data.

2. Why is the proposed code change a reasonable solution?

   The ASCE 32-01 Standard is a nationally accepted standard for minimum foundation depths and is already allowed for foundation design by both Minnesota Rule 1305 the *Minnesota Building Code* and Minnesota Rule 1309 the *Minnesota Residential Code*. Modifying Minnesota's foundation depth criteria using the ASCE 32-01 Standard with modifications to incorporate the complete dataset from 1951-2010 is a logical basis for determining required frost depths. Refining the ASCE 32-01 Standard's calculated minimum depths considering the practicality of enforcement, common construction practices, and local data such as snow cover, local climates, and population density results in reasonable data-based requirements for heated, semi-heated, and unheated structures.

   By contrast, the current rule assumes foundations for heated buildings and does not address isolated foundations that are not supporting heated buildings or semi-heated buildings.

   The Minnesota Energy Code already requires foundation insulation more than adequate to allow for consideration for foundation depth reduction in ASCE 32. Those are incorporated into the proposal since they are already mandatory for heated and semi-heated buildings.

   Rationale for Frost Depth Requirements

   When using the ASCE 32-01 Standard as the basis for required frost depth for heated, semi-heated, and unheated structures, factors included in calculations are whether the building is heated, semi-heated, or unheated, location-specific Air Freezing Index (AFI), Mean Annual Temperature (MAT), and the extent of insulation.

   Proposed Zone I is the most southerly zone, delineated along the north with a line representing approximately AFI 3000, modified to follow county boundaries.

   Proposed Zone II is the central zone, located between Zone I and Zone III, delineated along the north with a line representing approximately AFI 3500, modified to follow county boundaries, except splitting St. Louis County. St. Louis County spans Zone II and Zone III. A dividing line following state highways from county border to border delineates the northern line of Zone II in that county.

   Proposed Zone III is the most northerly zone, stretching from the Zone II northern boundary to Minnesota borders.

Foundation Depths for Frost Protection Determined per ASCE 32-01

	Zone I	Zone II	Zone III
Average Mean Temp (F)	43.2	40	37.3
AFI (max)	3000	3500	4000
Unheated Depth	45”	70”	95”
Heated and Semi-heated Depth	32”	44”	60”

Proposed Foundation Depths for Frost Protection

	Zone I	Zone II	Zone III
Unheated Depth	48”	60”	72”
Heated and Semi-heated Depth	36”	48”	60”

3. What other factors should the TAG consider?

   ASCE does not consider soil types to make frost depth determinations. This pre-supposes that conservative measures were taken during the engineering and the prescriptive calculations include the most frost susceptible types.

   Engineered design that is project specific is still aways available as an option if site conditions merit cost savings measures for shallower foundations.

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.

   Generally, this will be a cost decrease for foundations associated with heated and semi-heated buildings.

   The added language regarding foundation depths for unheated buildings and foundations not associated with heated structures will be a minor increase in excavation and materials. These are typically for post footings associated with decks and pole buildings.

   In proposed Zone I, for heated and semi-heated buildings, the footing depth requirement will decrease 6 inches (from 42” to 36”) in most southern counties in current Zone II and decrease 24 inches (from 60” to 36”) in Pine, Kanabec, and Mille Lacs counties, resulting in cost savings.

   In proposed Zone I, for non-heated buildings and isolated footings, the footing depth requirement will increase by 6 inches (from 42” to 48”) in most southern counties and decrease 12 inches (from 60” to 48”) in Pine, Kanabec, and Mille Lacs counties, resulting in cost savings.

   In proposed Zone II, for heated and semi-heated buildings, the footing depth requirement will decrease by 12 inches (from 60” to 48”) in most counties, resulting in cost savings, and increase 6 inches (from 42” to 48”) in Stevens and Pope counties, resulting in a cost increase.

   In proposed Zone II, for non-heated buildings and isolated footings, the footing depth requirement will not change in most counties. In Stevens and Pope counties the frost depth requirement will increase footing depth by 18 inches (from 42” to 60”), resulting in cost increase in the two counties.

   In proposed Zone III, for heated and semi-heated buildings, the footing depth requirement will not change.

In proposed Zone III, for non-heated buildings and isolated footings, the footing depth requirement will increase by 12 inches (from 60" to 72"), resulting in cost increase.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.

   Cost increases will be offset by added building durability and structure durability due to more specific construction to mitigate differential settlement due to frost heave.

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.

   Building owners will ultimately bear the costs. Most costs will be minimal and directed to those already building inexpensive structures like decks, detached unheated garages or pole buildings.

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.
   No.

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

   No.

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?

   Architects, engineers, developers, home designers, builders, residential contractors, building inspectors.

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.

   No.

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

   Most buildings will be over-designed for footing depth for frost protection resulting in higher construction costs. Some accessory buildings and structures will remain under designed and be at risk for differential settlement due to frost action on foundations.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.

   No

***Note: Incomplete forms may be returned to the submitter with instruction to complete the form. Only completed forms can considered by the TAG.

DEPARTMENT OF LABOR AND INDUSTRY

CCP-STR-2
8/8/24

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

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Telephone number: 651-284-5884

Firm/Association affiliation, if any: DLI/CCLD

Date: 8/8//2024

Model Code: N/A

Code or Rule Section: MR 1303.1600, Subp. 3

Topic of proposal: Frost protection for exterior door landings

Code or rule section to be changed: **1303.1600, Subpart 2 Soil under slab on grade**

Intended for Technical Advisory Group ("TAG"):

General Information	**Yes**	**No**
A. Is the proposed change unique to the State of Minnesota?	☐	☒
B. Is the proposed change required due to climatic conditions of Minnesota?	☒	☐
C. Will the proposed change encourage more uniform enforcement?	☒	☐
D. Will the proposed change remedy a problem?	☒	☐
E. Does the proposal delete a current Minnesota Rule, chapter amendment?	☐	☒
F. Would this proposed change be appropriate through the ICC code development process?	☐	☒

Proposed Language

1. The proposed code change is meant to:

   ☐ change language contained the model code book? If so, list section(s).

   ☐ change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

   ☐ delete language contained in the model code book? If so, list section(s).

   ☐ delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

   ☒ add new language that is not found in the model code book or in Minnesota Rule.

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.

1303.1600 FOOTING DEPTH FOR FROST PROTECTION.

Subp. 3. **Frost protection for exterior door landings.** Exterior doors utilized for means of egress or accessible entrances shall be provided with landings and associated foundations protected in accordance with subpart 1 or subpart 2.

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts. No, N/A

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)

   Means of egress are required to be unobstructed. Accessible entrances and accessible means of egress have tolerances of ¼" vertical. Landings subject to frost can rise several inches, enough to jamb doors and prevent exterior swinging doors from opening to allow free egress during emergencies. Frost protection of exterior landings is currently not specifically addressed.

2. Why is the proposed code change a reasonable solution?

   Providing frost protected foundations at exterior door landings used as means of egress and accessible entrances ensures that the landings will not move under frost conditions causing code violations in accessibility and means of egress.

3. What other factors should the TAG consider?

   None

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.
   No cost increase. Providing accessible entrances that maintain construction tolerances and providing unobstructed means of egress are already requirements of the building code. This is a clarification. If a designer wishes to submit an alternative design demonstrating equivalency, they may still do so under Minnesota Rule, 1300.0110, Subpart 13.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.

   No cost increase.

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.
   No cost increase.

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.
   No.

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.

   No.

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?
   Architects, engineers, developers, home designers, builders, commercial and residential contractors.

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.

   No.

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?

   Accessible entrances and means of egress will move out of tolerance under sub-freezing conditions resulting in inhibited accessibility and potential loss of life due to blocked means of egress under emergency conditions.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.

   No

***Note: Incomplete forms may be returned to the submitter with instruction to complete the form. Only completed forms can considered by the TAG.

DEPARTMENT OF LABOR AND INDUSTRY

CCP-STR-3a & 3b
9/5/24

CODE CHANGE PROPOSAL FORM

(Must be submitted electronically)

Author/requestor: C. Scott Anderson

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Telephone number: 612-246-7303

Firm/Association affiliation, if any: City of Minneapolis

Date: 6/13/24 Revised 7/8/24

Model Code: 2024 IBC

Code or Rule Section: 1809.5 + 1809.5.1 + 1010.1.5

Topic of proposal: Frost Protection and Landings at Exterior Exit Doors

Code or rule section to be changed: 1805.9 + 1809.5.1 + 1010.1.5

Intended for Technical Advisory Group ("TAG"):

General Information	**Yes**	**No**
A. Is the proposed change unique to the State of Minnesota?	☐	☒
B. Is the proposed change required due to climatic conditions of Minnesota?	☒	☐
C. Will the proposed change encourage more uniform enforcement?	☒	☐
D. Will the proposed change remedy a problem?	☒	☐
E. Does the proposal delete a current Minnesota Rule, chapter amendment?	☐	☒
F. Would this proposed change be appropriate through the ICC code development process?	☒	☐

Proposed Language

1. The proposed code change is meant to:

☒ change language contained the model code book? If so, list section(s). 1809.5 + 1809.5.1

☐ change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

☐ delete language contained in the model code book? If so, list section(s).

☐ delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

☒ add new language that is not found in the model code book or in Minnesota Rule. 1809.5 + 1809.5.1 + 1010.1.5

2. Is this proposed code change required by Minnesota Statute? If so, please provide the citation.
No

3. Provide *specific* language you would like to see changed. Indicate proposed new words with underlining and ~~strikethrough~~ words proposed for deletion. Include the entire code (sub) section or rule subpart that contains your proposed changes.

1809.5 Frost protection.
Except where otherwise protected from frost, foundations and other permanent supports of *buildings* and *structures* shall be protected from frost by one or more of the following methods:

1. Extending below the frost line ~~of the locality.~~ in accordance with 1303.1600.
2. Constructing in accordance with ASCE 32.
3. Erecting on solid rock.

~~**Exception:** Freestanding buildings constructed in accordance with Minnesota Rules, Chapter 1303, shall not be required to be protected.~~
Exception: Free-standing *buildings* meeting all of the following conditions shall not be required to be protected:

1. Assigned to *Risk Category* I.
2. Area of ~~600~~ 1,000 square feet (56 m^2) or less ~~for~~ of *light-frame* ~~*construction* or 400 square feet (37 m^2) or less for other than *light-frame construction*.~~
3. Eave height of 10 feet (3048 mm) or less.

Shallow foundation shall not bear on frozen soil unless such frozen condition is of a permanent character.

~~**1809.5.1 Frost protection at required exits.**~~
1010.1.5.1 Landings at Exterior Exit Doors
Frost protection in accordance with 1809.5 shall be provided ~~at~~ for exterior landings ~~for~~ at all ~~required~~ exterior exit doors. ~~exits with outward-swinging doors~~. Frost protection shall only be required to the extent necessary to ensure the unobstructed opening of the ~~required~~ exterior *exit* doors.

4. Will this proposed code change impact other sections of a model code book or an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.
No

Need and Reason

1. Why is the proposed code change needed? Please provide a general explanation as well as a specific explanation for any changes to numerical values (heights, area, etc.)

Section 1809.5.1 is relocated to 1010.5 as it is addressing landings and it is more likely that this requirement will be identified here than in the foundations section.
The model code only addresses out swinging doors. This revision addresses all exit doors regardless of the direction of the swing. Some structures may not require MOE doors to swing out yet do require accessible MOE. Not providing frost protection for the landings will increase the risk that frost heave will reduce the accessibility of the MOE. It also has the significant potential of creating a severe tripping hazard at the door threshold. While the potential tripping hazard will still exist at the edge of the landing it has at least been moved beyond the door threshold thus giving people the opportunity to avoid it. The word "required" has been removed because all exit doors need to be safe. Section 1010.1 requires that all doors provided for egress purposes in excess of those

required for egress are required to meet the requirements of chapter 10. Therefore frost protection should also be extended to all doors provided for egress purposes.
The Mn amendment referencing to chapter 1303 should be deleted. There are no freestanding buildings identified in 1303. There is a reference to soils under slab on grade buildings that I believe is the intent of this reference so I have modified the model code language to match up with the current Mn allowance of 1,000 s.f. and deleted the allowance for other than light frame construction.

2. Why is the proposed code change a reasonable solution?
   It addresses a life safety issue unique to cold weather climates.

3. What other factors should the TAG consider?
   None

Cost/Benefit Analysis

1. Will the proposed code change increase or decrease costs? Please explain and provide estimates if possible.
   This is an editorial change and should not impact the cost of construction. Structures are required to have foundations. A stoop or landing is a structure per the IBC definition.

2. If there is an increased cost, will this cost be offset by a safety or other benefit? Please explain. If the benefit is quantifiable (for example energy savings), provide an estimate if possible.
   No cost change

3. If there is a cost increase, who will bear the costs? This can include government units, businesses, and individuals.
   NA

4. Are there any enforcement or compliance cost increases or decreases with the proposed code change? Please explain.
   No

5. Will the cost of complying with the proposed code change in the first year after the rule takes effect exceed $25,000 for any one small business or small city (Minn. Stat. § 14.127)? A small business is any business that has less than 50 full-time employees. A small city is any statutory or home rule charter city that has less than ten full-time employees. Please explain.
   No

Regulatory Analysis

1. What parties or segments of industry are affected by this proposed code change?
   Architects, Contractors, Developers, Building Owners, Contractors, Building Officials

2. Can you think of other means or methods to achieve the purpose of the proposed code change? What might someone opposed to this code change suggest instead? Please explain what the alternatives are and why your proposed change is the preferred method or means to achieve the desired result.
   No

3. What are the probable costs or consequences of not adopting the code change, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals?
   Egress doors could become unusable during cold weather conditions thus trapping people inside a structure.

4. Are you aware of any federal or state regulation or requirement related to this proposed code change? If so, please list the federal or state regulation or requirement and your assessment of any differences between the proposed code change and the federal regulation or requirement.
   no

***Note: Incomplete forms may be returned to the submitter with instruction to complete the form. Only completed forms can considered by the TAG.