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CONSTRUCTION BULLETIN

Date: April 2011

Subject: Lateral Bracing of Residential Foundation Walls – [06-BCI-031](#)

There appears to be questions and concerns from the industry regarding the recently adopted Guidelines for Lateral Bracing of Residential Concrete Foundation Walls. Some of the questions are regarding deviation from the details, interpretation of the Scope of Guidelines (page 3), and when to apply each step of the guidelines.

The Builder is responsible to ensure the design drawings submitted in support of a Building Permit comply with the current edition of the Alberta Building Code. Where a residential foundation design does not comply with Section 9.15 Footing and Foundations of Division B, then the guideline may be used instead of site specific engineering.

A typical Part 9.15 foundation that does not require engineering would consist of an unreinforced foundation walls less than 2.5m (8'-4") in height. Typical 2x4 ladder or a mud sill anchored at the top that will allow the direct fastening of the floor and rim joists or the joists may be embedded in the wall. The wall may contain openings up to 1.2m in width and the total width of all openings in the wall must be less than 25% of the wall length. Based on this restriction, the minimum length of a foundation wall with a 4'-0" opening is 16'-0". Where more than 1 window opening is provided in a wall, the combined width of openings shall be considered a single opening if the average opening width is greater than the width of the solid wall between them. (A 48" window and a 30" window must be separated by at least 39" of solid concrete wall. If the two openings are closer than 39", then the both windows and the wall between them would be considered one larger opening but the 25% rule still applies.)

ANY deviation from Section 9.15 must be either designed as per the guidelines or will require site specific engineering. If the guidelines are to be used, all details must be provided on the foundation plans for the building. Steps 1, 2 & 3 of the Guidelines must be considered.

Step 1: Determine Reinforcement Requirements for Foundation Walls.

This step is used to determine the reinforcing of 8'4" and 9'4" foundation walls supporting various backfill heights. Although the table includes 8'4" walls supporting up to 7'6" of backfill, these walls do not require reinforcing because 9.15 permits walls up to 8'4" with 7'6" of backfill. Because the guidelines are also considered good construction practice, a builder may apply this step to the foundation design, but it is not required as part of the permit application. Step 1 only applies to foundation walls that include:

- a) 8'-4" foundation walls supporting MORE than 7'6" of backfill.
- b) Walls higher than 8'-4" but no more than 9'-4" that support ANY backfill height.

Note: Remember that the foundation wall height is the actual measurement of the wall from the top of footing to the top of the ladder or mudsill. Because the Code requires floor joists to be toenailed to the ladder or mudsill, adding additional plates to the top of wall to increase the basement headroom is not permitted.

Step 2: Determining Lateral Bracing required at joists to wall connections.

This step is used to determine the connection details of the floor system to the ladder or mudsill of the foundation wall. Because 9.15 approves foundation walls up to 8'-4" and supporting up to 7'-6" of backfill, this step would not apply and the floor system may be toenailed as usual to the ladder or mudsill. Where an 8'-4" foundation wall is supporting more than 7'-6" of backfill or the wall is higher than 8'-4" supporting any backfill height, Tables 2a, 2b or 2c must be applied. The type and spacing of the connections must be considered when specifying the floor joists on center spacing. If a connection is required every 12", then the joists and blocking panels must be at 12" on center. If the connection is required every 24" on center, but the joists are spaced at 19.2" or 16", every joist would require the connection. The blocking panels on parallel walls may be placed at 24" on center. The guidelines indicate that this additional bracing is not required within 8'-0" of a 90 degree corner in the foundation wall provided the abutting wall section is a minimum 48" long. Because this is a defined minimum, we cannot accept any foundation wall less than 48". Based on this requirement, a 16'-0" foundation wall at any height and backfill pressure would not require this lateral bracing as long as both abutting walls are at least 48" long.

The lateral connection must be constructed as per details shown in figures 1-5 of the guidelines. Each connection type has two details where, figure (a) is when the joists run perpendicular to the foundation wall and figure (b) where the joists run parallel. When figure (b) is required, additional blocking panels are required as shown in the detail at the spacing required in Table 2. An example would be referring to Table 2c High Plastic Clay (typical for Southlands), a 8'-6" foundation wall supporting 4'-0" of backfill requires a Type 1 connection at 32" on center. Figure 1a shows the connection of toenailing the joists to the ladder of the foundation wall perpendicular to the joist direction.. This would work for all joists spacing including 12", 16", 19.2" and 24" because no spacing will exceed the required 32" spacing of the connection. Figure 1b shows the connection required at the last spacing of the joists running parallel to the foundation wall. Because the connection is required every 32", additional blocking panels must be added in this joist space. The last joist spacing may have to be adjusted to ensure a 16" blocking panel is used as per the detail. The blocking panels must be toenailed to the top and bottom chord of the last joist as well to the foundation wall ladder. Although pony walls are permitted, the pony wall studs must line up with each blocking panel.

Step 3 Determine the Lateral Bracing required at windows and stairwells.

This step is used to determine if additional lateral bracing is required at windows and stairwell. This step applies to all openings over 1.2m (48") in any wall height supporting any backfill. This step also applies when a stairwell runs along the foundation and is longer than 48" and less than 12'-0". Stairwells longer than 12'-0" must be engineered. The required lateral bracing is required on each side of an opening, no matter the slope of the exterior grade. If a window or stairwell is located entirely within 8'-0" of a 90 degree corner, the additional bracing each side of the opening is not required provided the abutting wall is at least 48" long. Again, these measurements are defined and may not be altered.

Requests from Builder's, Designer's or Framer's to deviate or provide interpretations of the details contained in the guidelines cannot be provided by the Building Department. Because the guidelines were published by the AHITC and adopted by Municipal Affairs by [Standata 06-BCI-031](#), any questions must be directed to the publisher or the author, Bearden Engineering Consultants Ltd. Deviation to the guidelines must be approved by the author or require site specific engineering.

The City of Medicine Hat Safety Codes Services, in an ongoing effort to provide updates to Home Builders, Contractors, Designers and Trades people, regarding the Alberta Building Codes, provide these bulletins as a service. Any questions should be directed to the Residential plans examiner at 403-529-8205.