

FOUNDATION WALL WINDOW OPENING REINFORCEMENT

Article 9.15.4.3 of the 2015 National Building Code requires openings wider than 1.2 m (4 ft) in concrete foundation walls to be reinforced when the backfill height exceeds the maximum backfill height for laterally unsupported foundation walls in Table 9.15.4.2-A

Any opening in a foundation wall exceeding 1.2 m (4 ft) in width must meet these minimum requirements or be sealed by a Design Professional (structural engineer or architect) licensed to consult in Saskatchewan. The design assumptions below specify conditions that must be met in order to use these tables.

Table 1

Required Reinforcing for <= 8'-4" High Foundation Wall		
Width of Window Opening (ft)	# of Vertical Bars Each Side of Window (Each Face)	# of Horiz Bars (Each Face)
4 – 4.5	1 – 15M	1 – 10 M
4.5 – 7	1 – 15M	1 – 15M
7 – 7.5	1 – 15M	1 – 20M

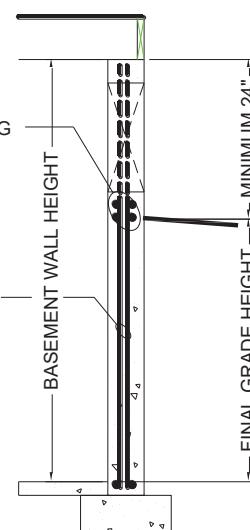
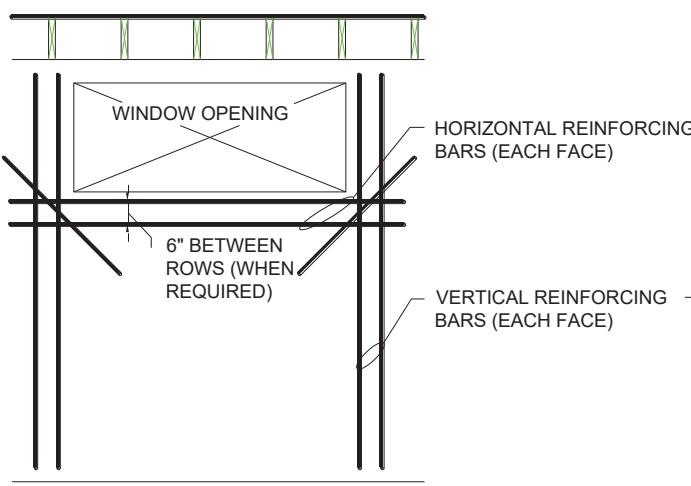
Table 3

Required Reinforcing for > 9' and <= 10' High Foundation Wall		
Width of Window Opening (ft)	# of Vertical Bars Each Side of Window (Each Face)	# of Horiz Bars (Each Face)
4 – 4.5	2 – 15M	1 – 15 M
4.5 – 5.5	2 – 15M	1 – 20M
5.5 – 6.5	2 – 20M	2 – 15M
6.5 – 8	2 – 20M	2 – 20M

Table 2

Required Reinforcing for > 8'-4" and <= 9' High Foundation Wall		
Width of Window Opening (ft)	# of Vertical Bars Each Side of Window (Each Face)	# of Horiz Bars (Each Face)
4 – 5	1 – 20M	1 – 15 M
5 – 6.5	1 – 20M	1 – 20M
6.5 – 7.5	1 – 20M	2 – 15M
7.5 – 8	2 – 15M	2 – 15M

Figure 1 – Diagrams for Window Opening Reinforcement



Designs Assumptions

1. 20 MPa, HS (Type 50) cement.
2. 200 mm (8 in) thick concrete.
3. Minimum concrete cover of 25 mm (1 in) and a maximum concrete cover of 50 mm (2 in).
4. "Each face" means one (or two) bar(s) adjacent to inside face and one (or two) bar(s) adjacent to the outside face.
5. Horizontal reinforcement is to be at least 2-10M top and bottom. For walls over 2.5 m (8 ft 4 in) high add 2-10M mid-height.
6. Each opening shall have a diagonal bar, at least 10M by 900 mm (36 in) long, installed at each lower corner and each face.
7. Finished grade to be at least 0.61m (24 in) from the top of the foundation wall.
8. Openings may not be more than 25% of the face of the concrete wall.