

The Bracing Requirements for 7CB: CFA[®] walls are determined based on the wall thickness, the wall height, the wall layout and the presence of permanent or temporary framing (girts, columns, roof, etc.). In addition, the choice of bracing methods is affected by the site conditions, the available bracing materials and the wall erection method, which is by using either individual components, or factory assembled wall sections.

7CB: CFA[®] provides permanent formwork for both faces of a wall and includes integral cross-ties to hold the two faces together during concrete placement. The empty CONFORM[®] components are able to span approximately 30 times the wall thickness under normal site conditions. The bracing is required to hold the wall straight, to provide lateral stability for wind and seismic loads and to resist construction loads during placement of concrete.

The major areas where bracing and additional formwork are required, are as follows:

1. Bracing for straight walls

- at the base
 - a continuous horizontal bracing member is required at one side or both sides of the wall to hold the wall straight.
 - the bracing may also act as formwork to cover any gaps at the underside of the wall due to irregularities in the surface of the top of the foundation or slab.
 - the bracing is anchored to the wall and the foundation as required for the lateral wind forces and vertical forces from rakers.
- at mid-height (if required)
 - a continuous horizontal bracing member is required at one side or both sides to hold wall the straight
 - bracing is connected to diagonal rakers that are anchored to deadmen or a slab, in order to hold wall plumb.
 - bracing is anchored to wall and rakers as required for the lateral wind forces and vertical forces from rakers.
- at the top
 - a continuous horizontal bracing member is required at one side or both sides to hold wall straight.
 - bracing may also act as formwork to provide a smooth or level surface at the top of the wall due to minor variations in the lengths of the CONFORM[®] components.
 - the bracing is connected to diagonal rakers that are anchored to deadmen or a slab, in order to hold wall plumb.
 - bracing is anchored to the wall and the raker as required for lateral wind forces and vertical forces from rakers.

2. Formwork and bracing for ends, corners and intersections of walls

- partial or full height vertical formwork is required to resist the horizontal concrete pressure in order to maintain a flat surface and prevent the face of the wall from bowing.
- the formwork is connected at top and mid-height to diagonal rakers that are anchored to deadmen or a slab in order to hold wall face plumb, to prevent the wall elongating during concrete placement and to prevent separation between the wall and the starters or end caps.
- the formwork is anchored to the wall and the rakers to resist the horizontal concrete pressure, lateral wind forces and vertical forces from rakers.

3. Formwork and bracing at openings in walls

- a continuous buck is required around all openings to resist the vertical and horizontal concrete pressure in order to maintain a flat surface and prevent face of faces of the opening from bowing.
- the buck is connected, when required, to vertical and horizontal bracing and shoring in order to keep the opening square, at the correct dimensions and to support the wet concrete placed above the opening.
- the buck is connected, when required, to diagonal rakers that are anchored to deadmen or a slab in order to hold opening plumb, to prevent the wall from bowing at the opening and to prevent separation between the wall and frames, starters or caps around openings.
- the buck is anchored to the wall and the rakers to resist concrete pressure, lateral wind forces and vertical forces from rakers.

Bracing Requirements

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An Estimate of Wood Bracing Quantities required for CONFORM® walls up to 4 meters or 13 feet high can be based on the following "rules of thumb".

1. Proposed Bracing

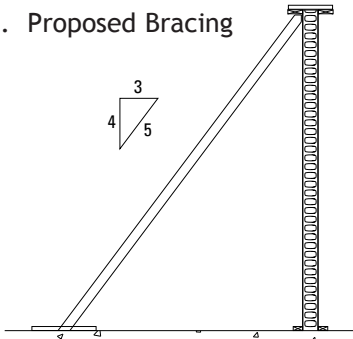


FIG. A

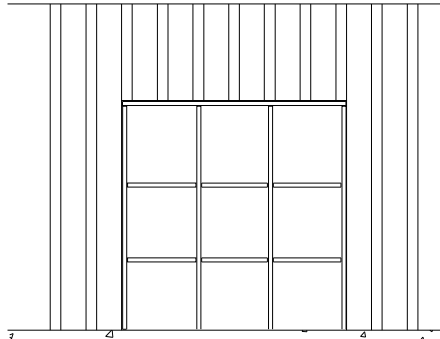


FIG. B

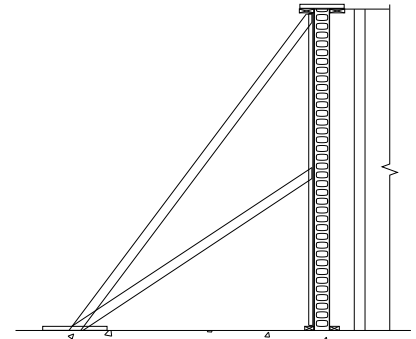


FIG. C

2. The wood bracing at the bottom of the wall, at the top of the wall and for the rakers (Figure A) is 2x4 lumber. The quantity of 2x4 lumber can be estimated as follows:
 - The length 2x4 pieces to be ordered is the same as the maximum length of the rakers which equals 1.25 times the ridge wall height.
 - The total length required equals the total length of all walls times 4.35 for top and bottom horizontals, times 1.5 to include the rakers and times 1.1 for wastage.

Total length of wall bracing	=	Σ wall length	_____	x 4.35 x 1.5 x 1.1	=	_____
Maximum length required	=	ridge wall height x 1.25			=	_____
No. of pieces	=	total length / max. length			=	_____

3. The bracing at openings (Figure B) and at starters or wall intersections (Figure C) depends on the type of CONFORM® wall: CF4 walls require 2x4 lumber, CF6 walls require 2x6 lumber, CF8 and CF8ii walls require 2x8 lumber.
 - The length of the 2x4 pieces to be ordered is 16'-0" to minimize wastage.
 - The total length required equals the sum of 4 times the total height of all openings, 3 times the total width of all openings, and 1.5 times the total length of all starters and all multiplied by 1.1 for wastage.

Total length of opening bracing	=	Σ opening heights x 4	=	_____
	+	Σ opening widths x 3	+	_____
	+	Σ starter heights x 1.5	+	_____
			=	_____ x 1.1 = _____
Maximum length required	=		=	16'-0"
No. of pieces	=	total length / max. length	=	_____

4. The ballpark cost of the bracing material can be determined by multiplying the length of lumber by a unit cost of \$1.50 per linear meter or \$0.50 per lineal foot cost.
 - Total cost equals the length of the wall bracing, plus the length of opening bracing times the cost

Total ballpark cost	=	length of wall bracing	=	_____
	+	length of opening bracing	+	_____
	=		m x \$1.50 =	_____
	or =		ft x \$0.50 =	_____