

STRUCTURAL DESIGN OF THE BLOCK JOIST SYSTEM™

Block Joist™ floors and roofs are designed to be simply supported slabs in accordance with the provisions of ACI 318-95 with certain conservative exceptions.

- The flexural capacity reduction factor, ϕ , is 0.80 (instead of 0.90).
- For flexure, the reinforcing bars are assumed to be the entire tensile reinforcement for the fire-resistant rated Block Joist Systems™, i.e., the bottom flanges of the joists are neglected.
- For non-fire-resistant rated Block Joist Systems™, the bottom flanges of the joists provide the tensile reinforcement.
- The maximum depth of the compressive zone is assumed to be 3/4 in., i.e., the depth of the grout key. Compressive strength of the masonry units is assumed to be 1900 psi.
- Superimposed loads are assumed to be live (transient) loads having a load factor of 1.7 even though part of that load may be dead (permanent) load requiring a load factor on only 1.4.
- The entire shear force is assumed to be resisted by the Block Joists™, i.e., the contribution of the grout and masonry is ignored.
- For deflection calculations, the section is assumed to be cracked throughout its length. The transformed section consists of the top and bottom chords of the joists and the top 3/4-inch depth of the block, using a modular ratio, n , of 20.
- Deflection due to superimposed load is less than 1/360th of the span in all cases. (That deflection limit governs only for the longer spans of 24-inch Block Joist Systems™ utilizing joists made of steel having yield strength of 50 ksi.)