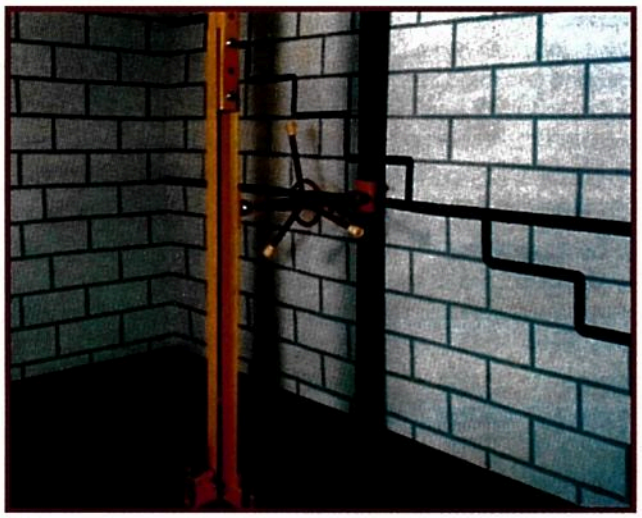
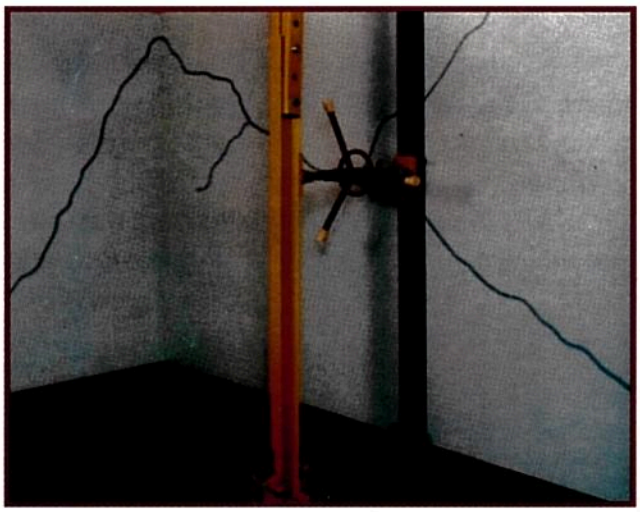
The Solution for Horizontal Movement

How the United Structural Systems I Beam Support System Works

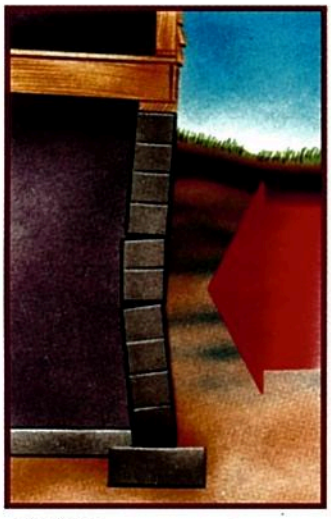
The United Structural Systems I Beam Support System is capable of straightening and reinforcing basement walls to give the strength needed to resist earth pressure in block or poured concrete.



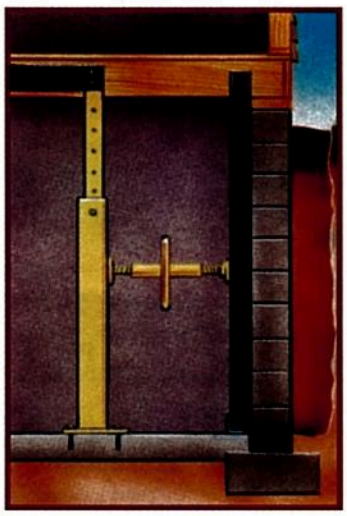
Block wall cracks in basement usually create mid-wall bowing. The United Structural Systems I Beam Support System provides fast and easy repair.



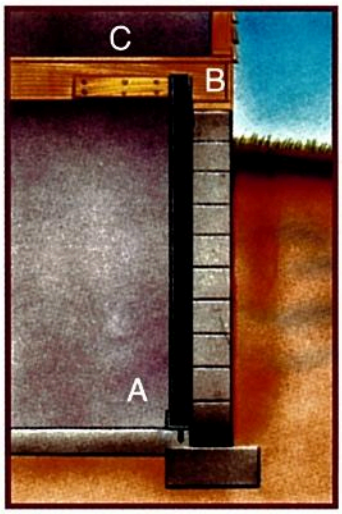
Cracks in poured basement walls usually create top wall displacement. The United Structural Systems I Beam Support System corrects the problem by applying pressure on the tipped area. The jack is versatile enough to slide up or down and lock to exert pressure at several points, thus making it possible to correct complex wall displacement.



Before



During



After

The United Structural Systems I Beam Support System continues to work after the wall is straightened. The steel wall reinforcing beams provide continuing support, safeguarding against potential future problems. The beams are secured by steel boots, which are bolted into the concrete floor and footing and wedged against the wall A. The beam s top is secured by bracing into the floor joists B. When the United Structural Systems I Beam Support System stanchion is removed, the top angle support remains in the floor joists for extra strength C.

Abe Jack Technical Data

EXPERT REPAIRS

JOSEPH A. MEYER 81-2011 LICENSED STRUCTURAL ENGINEER OF ILLINOIS BARRINGTON, IL

Vertical Support Member

Spacing of Vertical Supports = 6'-0"

W = $110^{\#/FT^3}$ x 7.33' x 0.35 x 7.33' x 1/2 x 6.0' = 6206#

R_T = 6206# ⌋ 3 = 2069#

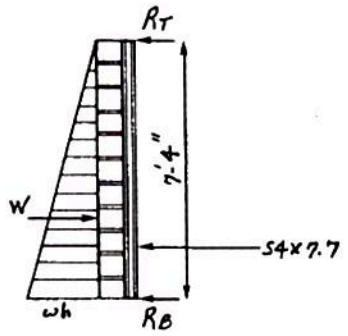
R_B = 6206# x 2/3 = 4137#

M = 0.1283WL = 0.1283 x 6206# x 7.33' = 5836'#

S = 5836'# x 12"/' ⌋ 24,000#/□" = 2.92 in^3 • <3.04 in^3

μ = 4137# ⌋ (0.193" x 4.0") = 5359#/□" <14,400#/□"

Δ = 0.01304 $\frac{WP^3}{EI}$ = $\frac{0.01304 \times 6206^{\#} \times 88^3}{29 \times 10^6 \times 6.08}$ = 0.31"



Use S 4 x 7.7 e 6'-0" 0/c

Top Support (Perpendicular Joists)

Load/Floor Jst. = 2069# ⌋ 3 = 690#

(Member #1)

Br'g. Area = 690# ⌋ 600#/□" = 1.15□"

No. of Nails = 690# ⌋ 130#/Nail = 5.3

(Member #2)

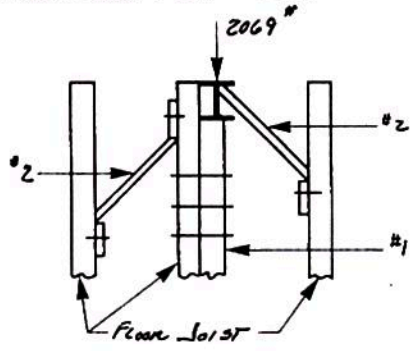
P = 690# x 1.414 = 975#

F_N = 0.30 x 1,000,000 ⌋ $(\frac{20.5}{0.75})^2$ = 402#/□"

A = 975# ⌋ 402#/□" = 2.42□"

Br'g. Area = 975# ⌋ 400#/□" = 2.43□"

No. of Nails = 690# ⌋ 130#/Nail = 5.3



Use 2 x 6 w/6-16d Nails
Use 1 x 4 Diagonal Wood Brace
w/6" x 6" x 1/2" Plywood Plate & 6-16d Nails

Base Support

Horizontal Load = 4137#

No. of Bolts = 4137# ⌋ 2640# Shear/Bolt = 1.6

(Angle Thick for Bolt Shear)

A, • 4137# ⌋ 14,000#/□" = 0.30□"

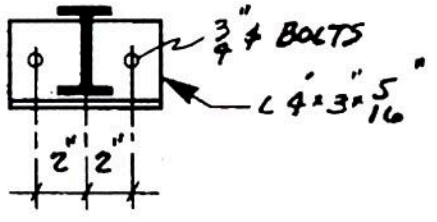
t = 0.30□" ⌋ (4 x 1.62") = 0.05"

(Angle Thick for Bending)

M = 4137# x 1/2" = 2068"#

S = 2068"# ⌋ 24,000#/□" = 0.086 in^3

t = $\frac{\sqrt{0.207 \times 6}}{6}$ = 0.29"



Use L 4" x 3" x 5/16" x 0'-6" Angle w/2-3/4" Bolts Grouted into Concrete Floor 3" min. Thickness

Top Support (Parallel Joists)

Br'g. Area = 2069# ⌋ 600#/□" = 3.45□"

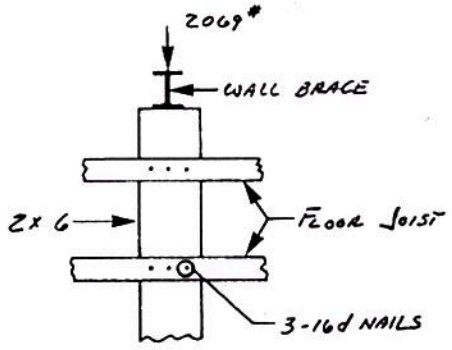
No. of Nails = 2069# ⌋ 130#/Nail = 16

(Diagonal Vertical Brace)

Load/Brace = 2069# ⌋ 6 = 345#

F_a = 0.30 x 1,000,000 ⌋ $(\frac{17.6}{0.75})^2$ = 545#/□"

A = 345# ⌋ 545#/□" = 0.64□"



Use 2 x 6 Horizontal Plate Across Bottom of Six Floor Joists w/1 x 6 Diagonal Brace Between Six Joists Placed Over 2 x 6 Plate