Professional engineer certified calculations
Cover letter - page 1 of 4
This door engineer certified for 7,200 pounds per square foot (50 pounds per square inch) in the seated condition and 2,088 pounds per square foot (14.5 pounds per square inch) in the unseated condition (rebound response).

Maurice E Farr
Professional Engineer
23811 105th Street Court East
Buckley, WA 98321-8410

March 30, 2015

To Whom it may concern:

American Safe Room blast doors, double leaf series, ASR-50-DBL-BD with an 80 inch span distance, inside height are certified to withstand a force of 50 PSI in the seated direction and 14.5 PSI in the unseated direction.

Reference drawings:

1. ASR-DD-3: 50 PSI blast load in the seated direction
2. ASR-1.2A: rebound load on cam latch assembly
3. 6033-41: cam latch detail

Drawings were prepared under my direct supervision.

Maurice E Farr, PE

Maurice E Farr, PE
Professional engineer certified calculations
Blast load calculations - page 2 of 4
The composite door leaf is being considered as a steel beam with 1” flanges and a concrete equivalent width of steel (1/32”).

80” Span, 5-1/2” Depth, 1/4” Skin
Double Leaf Door
Supported Uniform Load

5” inside, 1/4” thick door shell, 1” width

\[ V = \text{Point Load} \]
\[ A' = 1/2 \text{ Area of beam} \]
\[ \bar{y} = \text{dist from center to centroid of } A' \]
\[ I = \text{Moment of Inertia of beam} \]

Moment developed from 0.05 ksi uniform loading
\[ M = \frac{wI^2}{8} \]
\[ M = 0.05 \times 77^2 = 37.1 \text{ in-kips} \]

Stress in steel flange from the 0.05 ksi uniform load
\[ f_b = \frac{Mc}{I} \]
\[ f_b = \frac{37.1 \times 2.56}{4.74} = 20.0 \text{ ksi} < 23 \text{ ksi} \]

(No harm to door shell from bending)

Principal moment of inertia \( I = 4.74 \text{ in}^4 \) from AutoCAD information

Shearing Stress from the 0.05 ksi uniform load
\[ V = \frac{0.050 \times 77}{2} = 1.93 \text{ kip} \]
\[ f_s = \frac{V A' \bar{y}}{I} \]
\[ f_s = \frac{1.93 \times 0.33 \times 2.30}{4.74} = 1.46 \text{ ksi} \]

Maurice E Farr, PE

Expires 6-15-2016
Professional engineer certified calculations

Door leaf span - page 3 of 4

This certification is for doors with a span distance of up to 80 inches - top to bottom.
Professional engineer certified calculations

Cam latch load rating - page 4 of 4

The cam latches are the first mode of failure in the rebound response. They are rated for 14,816 pounds each.