

## **Construction Measurements for ACI 117 Tolerance Committee**

It's been 5 years since ASCC published its document on "Tolerances for Cast-in-Place Concrete Buildings". Table 1 shows some of the measurements we presented in that book and used as an aid for developing what we believe are realistic and achievable tolerances. In some instances, thousands of measurements were available but in other cases less than 100 measurements were available. We need more measurements to better define tolerances for both the vertical and horizontal envelope of members. We also need measurements made in the field to confirm existing tolerances or suggest better ones for the following:

- Anchor bolt locations
- Embed plate location and flushness
- Dowel bar placement
- Rebar bend diameter
- Rebar lengths
- Stirrup and tie bar dimensions
- Post-tensioning strand placement
- Drilled shaft measurements
- Foundation elevation and location

If you have field measurements related to any of these topics, please consider sending the data to Ward Malisch or me. We will keep the source confidential but will provide a summary of all data collected to ACI Committee 117 for their consideration in revising ACI 117-10 "Standard Tolerances for Concrete Materials and Construction".

We should note the assistance of many ASCC contractor members that are voting members of this committee:

- Scott Anderson, Charles Pankow Builders
- Scott Anderson, Keystone Structural Concrete, LLC
- Ron Eldridge, Sundt Construction, Inc.
- Mike Hernandez, Baker Concrete Construction
- Geoffrey Kinney, Concrete Floor Contractors Association of Canada
- Eric Peterson, Webcor Concrete
- Mike Schneider, Baker Concrete Construction
- Brett Szabo, James McHugh Construction Company
- Scott Winkler, CECO

<b>Table 1 Measurements Collected in ASCC Tolerance Book</b>		
<b>Vertical Envelope</b>	<b>No. of Buildings</b>	<b>No. of Measurements</b>
Wall Location at Bottom	3	20
Column Location at Bottom	1	142
Relative Alignment - columns	200+	2,562+
Relative Alignment - walls	200+	1,046+
<b>Horizontal Envelope</b>		
Column Location	1	86
Wall Location	1	316
<b>Elevation Control</b>		
Top of Beam	200	Not reported
Top of Structural Slabs	201	Not reported
Bottom of Slab Soffit	200	Not reported
<b>Cross-Sectional Dimensions</b>		
Slab-on-Ground	8	30,000+
Suspended Slabs	Not reported	3,454
Beam Depth	Not reported	541
Beam Width	Not reported	315
Column Thickness	Not reported	2,354
<b>Concrete Cover - Buildings</b>		
Beams and Slabs	Not reported	8,774
Columns and Walls	25	Not reported
<b>Concrete Cover - Bridges</b>		
Bridges	216	10,000+
Bridge Decks	Not reported	5,168
<b>Reinforcement Location</b>		
Elevated Slabs – top bars	Not reported	1,696
Elevated Slabs – bottom bars	Not reported	2,805