



American Concrete Institute

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## Meeting Minutes

### ACI COMMITTEE 313 Bins and Silos

#### Virtual Meeting Minutes March 30, 2021 / 1:00 P.M to 5:00 PM Eastern

#### 1. Agenda

##### 1.1 Call to Order

##### 1.2 Attendance

**Regrets:** Bill Bokhoven, German Gurfinkel, Dick Kobetz, Rod Nohr

**Voting:** Bryan Coussens, Craig Thompson, Dave Mattes, Dennis Blauser, Douglas Nagel, Luis Hernandez, Pat Ebner, Robert Esplin, Ryan Ebmeir, Steve Frankosky, Timothy Harvey, Bill Arockiasamy

**Associate:** Atul Kulkarni, Eliya Henin, Jesus Sagarnaga, Zane Wells  
Visitor: Matt Senecal

Agenda approve Robert Esplin 2<sup>nd</sup> by Dennis Blauser, No one opposed this.

##### 1.3 New Revisions

##### 1.4 Update of Moving into New Format

Discussion on actual layout. During Work on document commentary below section, but in final will probably need to go to side by side. There are some figures that it would be nice to have as full width figures that may be in the commentary. This will be discussed with the publishers. There was also discussion on the advantages and disadvantages of being code vs a standard vs a specification. Dave will attempt to add new information to the code in green, and commentary in purple.

##### 1.5 Task Groups Reports

###### *TG1 – Format and References*

Tim Harvey, Dave Mattes and Rob Esplin

Dave has completed the 1<sup>st</sup> draft with the whole document in the new format. He will make updates per our discussion. He will send those out by the 16<sup>th</sup> of April. The rest of the committee will have until May 15<sup>th</sup> to get comments back. Stacking tubes will be in Chapter 10 and Multi Cell construction will be in Chapter 11.

*TG2 – Inspections, Jumpform Construction, Testing*

Dennis Blausler, David Mattes

*TG3 – Definition of deep and shallow silos*

Rod Nohr, Rob Esplin, Zane Wells, Ben Davis

Nothing done with this.

*TG4 – Eccentric Flow, combined tension and bending analysis*

Tim Harvey, Dick Kobetz, Doug Nagle, and Mike Simpson

*Highlights – Tim Harvey*

Changes or additions that I have made are highlighted in yellow.

6.3.2.3 and 4 are included because of additions I made to the commentary.

In 6.4.4.2, I have included a requirement that silo walls subject to asymmetric flow shall have two faces of circumferential reinforcement. I believe this is prudent.

R6.4.4.3 (Commentary) includes some additional verbiage and my revised C1 curves with equations. I just realized that I neglected to include the C2 table that is included in Figure R6.4.4.3 in the 313-16 document. I will add it as Fig. 6.4.4.3c.

I have been bothered for years by the discrepancy between the Giunta figure and the equation. The equation indicates that a flow channel continues to expand until it hits the silo wall or the top of the material pile, while the figure shows it reaching a maximum size. I recommend that we add a maximum flow channel size of  $Y_{max}$ . I have modified the figures and the commentary to incorporate and explain  $Y_{max}$ .

Doug Nagel pointed out discrepancies with the pressure calculations for constant size and converging flow channels. I have made 6.4.4.5 a section dedicated to constant size flow channels, and added a new section 6.4.4.6 for converging flow channels. I believe the division into two sections makes sense.

Please note – I have been using the flow channel method, or variations on it, for many years. My design philosophy has almost always been to utilize a constant size flow channel in lieu of dealing with the converging channel. Using the larger, constant size ( $Y_{max}$ ) flow channel provides conservative estimates of the wall bending moments. The commentary section R6.4.4.6 explains this.

Please note that I have not addressed the Eccentricity Method. In my opinion, it should be removed from the document. There are committee members who will strongly disagree with me on this.

*TG5 – Material Properties*

Joe Marinelli, David Pettit, and Rod Nohr

None of these people were at the meeting.

*TG6 – Roof Beams and Beam Bearings, Silo Operation*

Gerry Lynskey, Kevin Cove, Bill Arockiasamy

*TG7 – Alternative reinforcing, repair and modification of silos*

Doug Nagel and Gerry Lynskey

There was some discussion on the advisability of allowing FRP for use as the main reinforcing on silos. The consensus of the committee is that it is not a good idea. A sentence in this regard will be given to Dave.

*TG8 – Multi-cell rectangular storage structures*

Dick Kobetz, Ryan Ebmeier, Bill Arockiasamy and Pat Ebner

*TG9 – Seismic loading of silos*

Zane Wells, Luis Hernandez, Rod Nohr, and Mike Simpson

It is not looking like there will be any seismic information in the next version of the code. We are hoping to get more information from Greg, but it does not look like this will happen until after he gets his paper published.

**2. New Business****3. Flow Channel – Tim Harvey****4. Next Meeting****5. ACI Convention, Atlanta, GA – October 17 – 21, 2021**

ACI 313 Meeting - October 19th

**6. Virtual Meeting - XXXX**

The next meeting will be on the 27<sup>th</sup> of July at 1:00 PM Eastern time.

**7. Adjournment**

Motion to adjourn by Denis with Tim being the 2<sup>nd</sup>. – No Opposition.