

SS4: 5:30-6:45
SSRC Workshop 2

*System Stability
and
Outreach*

Moderator:
R. D. Ziemian

Summary Report - 2009 SSRC/AISC

- Task Groups Related to System Stability
 - TG13 Thin-Walled Metal Construction
 - TG14 Horizontally Curved Girders
 - TG20 Composite Members and Frames
 - TG24 Stability of under Seismic Loading
 - TG27 Plate and Box Girders
 - TG30 Bracing
 - TG4 Frames
- Open discussion of new efforts in frame and system stability

TG 2009 Activity Reports:

- Progress on SSRC Guide Chapters
- Updates on current research
- Potential future research
- Excellent summary available from SSRC
- So we now know we are (2009), but where do we want to go (2010)?

Frame Stability

- “Direct Analysis Method”
 - AISC Appendix (2005) –to– Chapter C (2010)
 - AISI Appendix (2007)
 - AA Chapter C (2010)
 - CSA, others...been there done that.
- Link:
 - Direct Analysis Method + Direct Strength Method
 - GBT?
- Design by Inelastic Analysis
 - AS4100/NZ Levels of Analysis -to- Advanced Analysis
 - Eurocode?
 - AISC Appendix 1

AISC Appendix 1

Design by Inelastic Analysis

- More sophisticated the analysis, more relaxed the requirements:
“Strength limit states detected by an inelastic analysis ... are not subject to the corresponding provisions of the Specification ...”
- In all cases, the strength limit states defined in Chapters D - K must be considered
- Perhaps, first significant step towards an AISC Performance Based Design Specification
- Many research opportunities that can end with real design applications...
slender sections, composite, seismic, ...

Parallel Breakout Sessions (50 min.)

- Systems and Bracing Research Group, C. Foley
Members and friends of:
 - TG4 Frames
 - TG30 Bracing
- Extreme Loads Research Group, A. Varma
Members and friends of
 - TG24 Stability under Seismic Loading
 - TG20 Compression Members and Fire
- Outreach Group, D. Camotim
Members and friends of
 - TG 11 International Cooperation of Stability
 - Studies –SSRC Education programs

Charge

- In depth discussion of future directions related to performing and disseminating stability research.
- See you at 6:40!

Breakout Session Reports (brief)

- Systems and Bracing Research Group, C. Foley
- Extreme Loads Research Group, A. Varma
- Outreach Group, D. Camotim

AISC App. 1

The inelastic analysis shall take into account:

1. ...deformations that contribute to the displacements of the structure
2. ...second-order effects
3. ...geometric imperfections
4. ...stiffness reductions due to inelasticity
 - effect of residual stresses
 - partial yielding of the cross section
5. ...uncertainty in strength and stiffness
6. New opportunities...