

Trends

Response to Building Damage Caused by Tornadoes

Thomas L. Smith, AIA, RRC, F.SEI

TLSmith Consulting Inc.

Rockton, IL

Lubbock F5 Tornado, 1970

- TTU investigated that event and pioneered field research investigations of tornadoes and hurricanes
- Post-tornado observations often revealed that small interior rooms survived



Occupant Protection Based on Damage Observations

- TTU developed design for in-residence shelter
- Refined & published as FEMA 320 in 1998
- 1999, Kansas & Oklahoma tornado outbreak (FEMA P-342, 1999)
 - FEMA P-361 (2000): Community safe rooms
 - FEMA P-431 (2003): Best available refuge areas

- ICC 500 published in 2008
- IBC 2015 requires ICC 500-compliant safe rooms in new schools, fire & police stations
- IBC 2018 requires safe rooms in existing schools that undergo certain additions

Design Guidance to Minimize Damage

- Spring 2011 tornadoes (FEMA P-908)
 - Technical guidance for strengthening critical facilities to minimize damage from weak and strong tornadoes
 - Many of the recommendations were incorporated into the design of the new Joplin hospital