

Design for Vehicular Collisions

State pooled fund Study: TPF-5(106)

Gregg A. Freeby, PE
Project Director



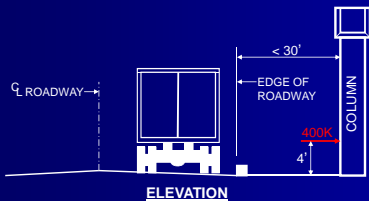
Vehicular Collisions

Bridge Design
LRFD introduced design
loads and criteria for
vehicular collisions.



Vehicular Collisions

AASHTO LRFD Article 3.6.5.2



Vehicular Collisions

Origin of LRFD Provisions

- LRFD provisions are from recommendations by T.J. Hirsch, Texas Transportation Institute based on full scale crash tests:
- Load cell wall
- 80,000 lb vehicle @ 50 mph



Field Performance?



Corpus Christi, Texas 2004

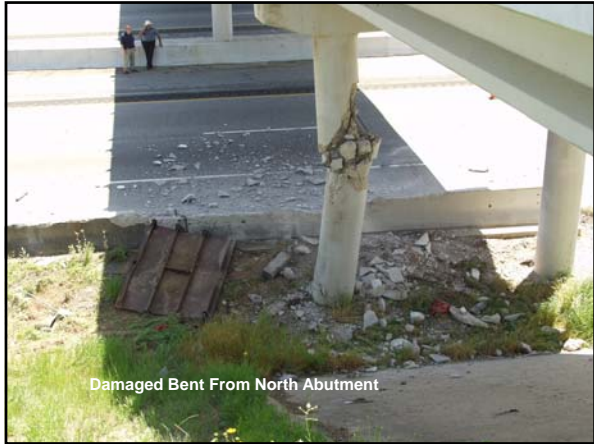


Sealy, Texas. 2004









Damaged Bent From North Abutment





Lead Truck with similar load.



Red Oak, Texas. 2005





Minnesota 2003

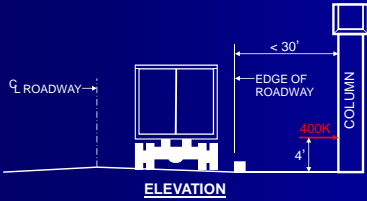






Vehicular Collisions

AASHTO LRFD Article 3.6.5.2



Vehicular Collisions

Key issues:

Magnitude of force. 400 kips???

Risk/Probability

Roadway speed and geometry.

Structural redundancy

Vehicular Collisions

Solution?

State pooled fund study!

Began in April 2007.

Pooled Fund Study

- Phase 1 ~ Statistics & Simulations
- Phase 2 ~ Verification of loads and assumptions

Phase 1

- Task 1a ~ Literature Review
- Task 1b ~ Computer Simulations
- Task 1c ~ Accident Survey
- Task 1d ~ Risk Analysis
- Task 1e ~ Work Plan for Phase 2
- Task 1f ~ Project Meeting (Today!)

Phase 2

- Task 2a ~ Single-Unit Truck Test
- Task 2b ~ Tractor-Trailer Crash Test

Contact Information

Gregg A. Freeby, PE
TXDOT Bridge Division
gfreeby@dot.state.tx.us
(512) 416-2192
