AAPT 2014


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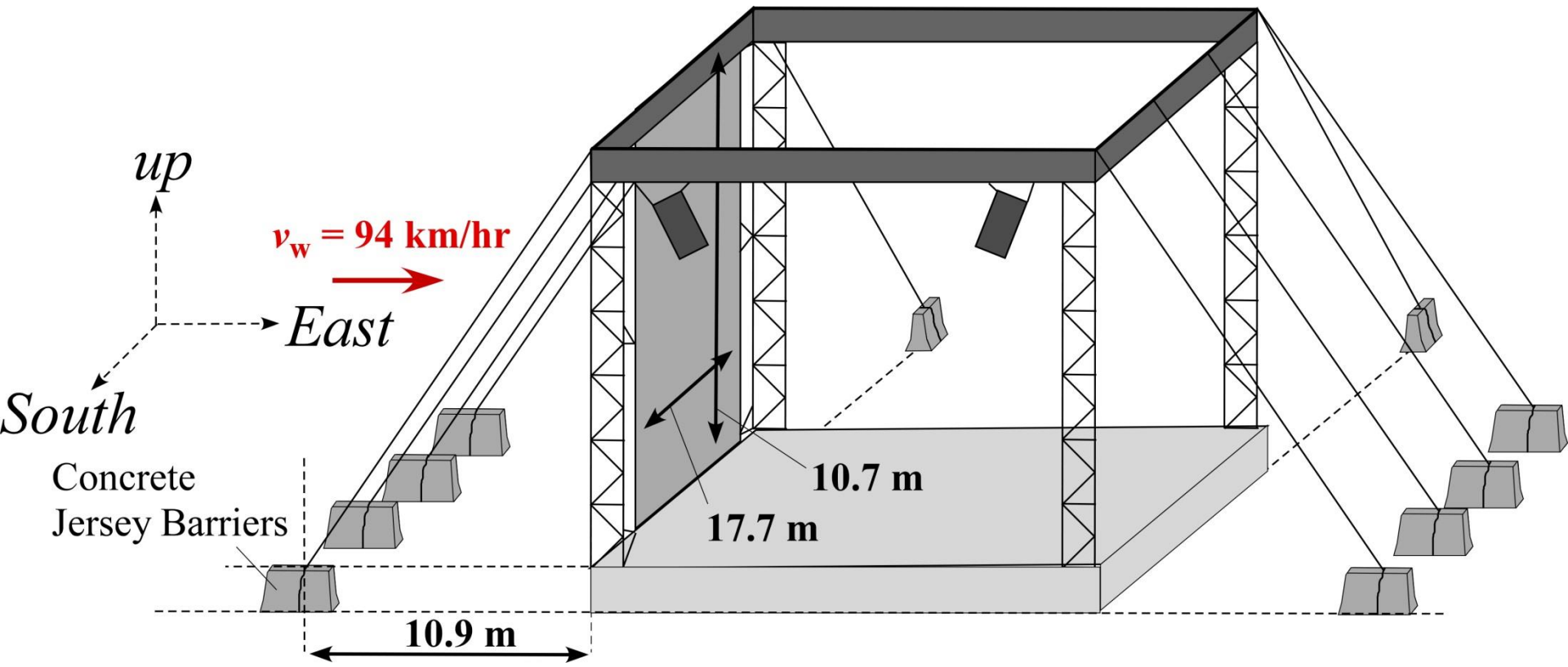
# Fatal Friction Flaw


Holmquist, J., 2013, *Early morning winds, rain cause damage around New Richmond*, Pierce County Herald, June 23

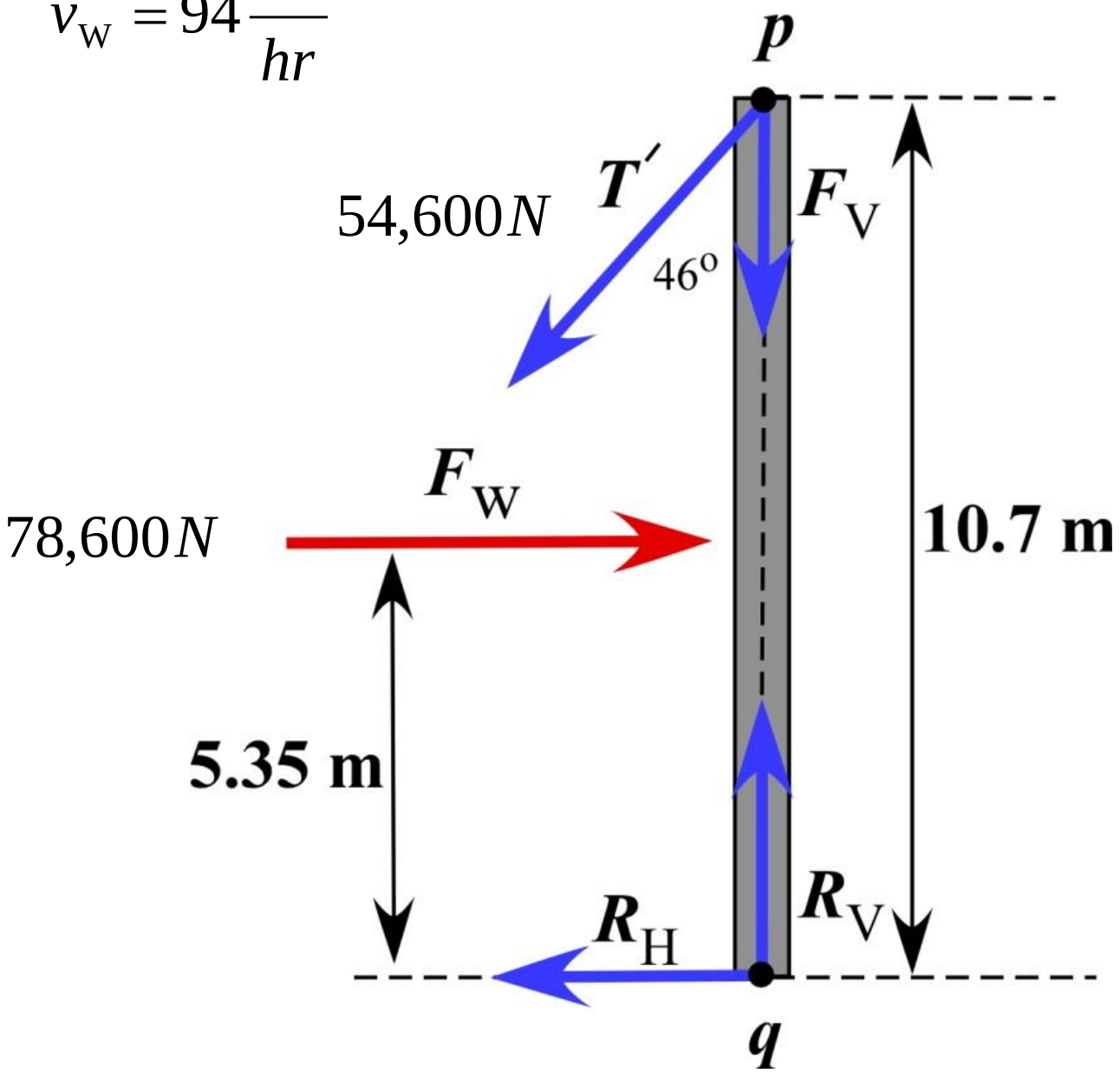

GRANDSTAND

$$P_W \approx 0.047 v_W^2$$

*Simplified Model for An Introductory Physics Case Study*



$P_W \approx 0.047 v_W^2$ $\quad v_W = 94 \frac{km}{hr}$



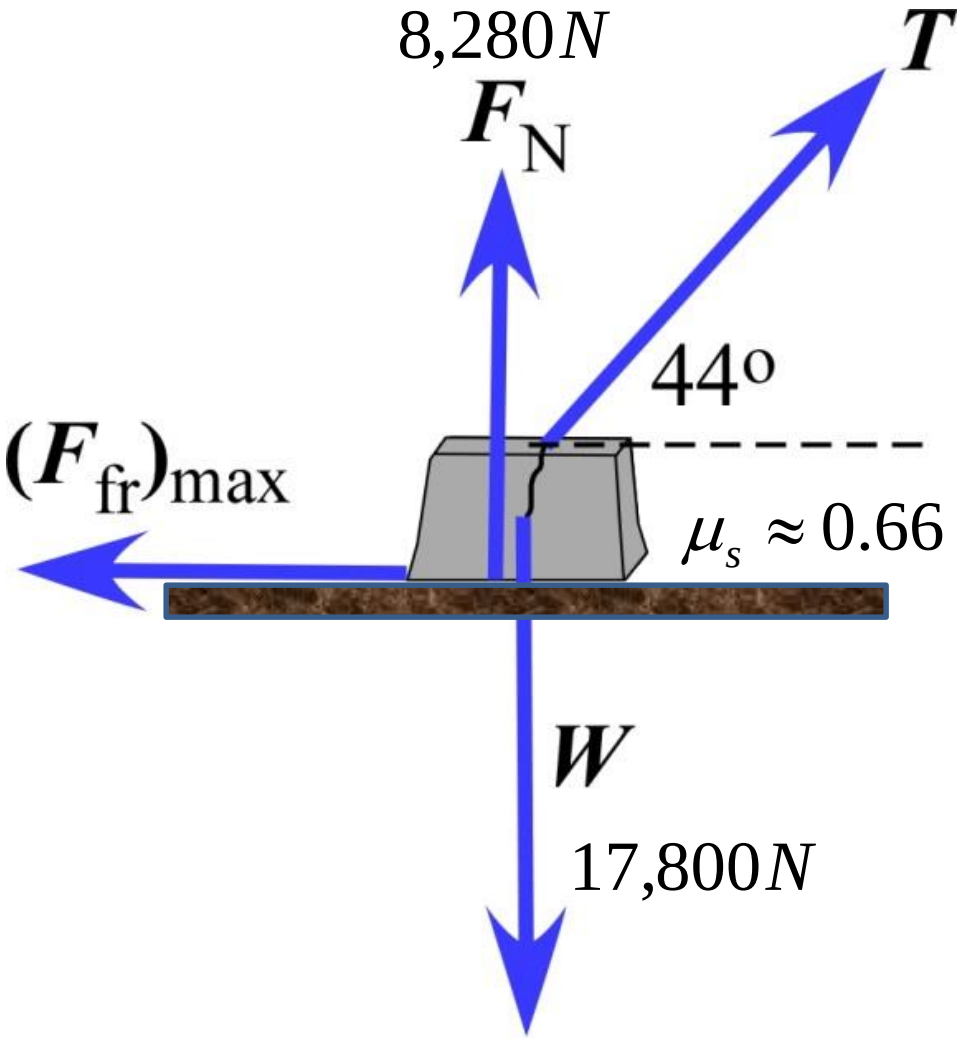

*Left Wall*

$(F_{fr})_{\max} = 5{,}560N$ $T_x = 9{,}850N$ $13{,}700N$

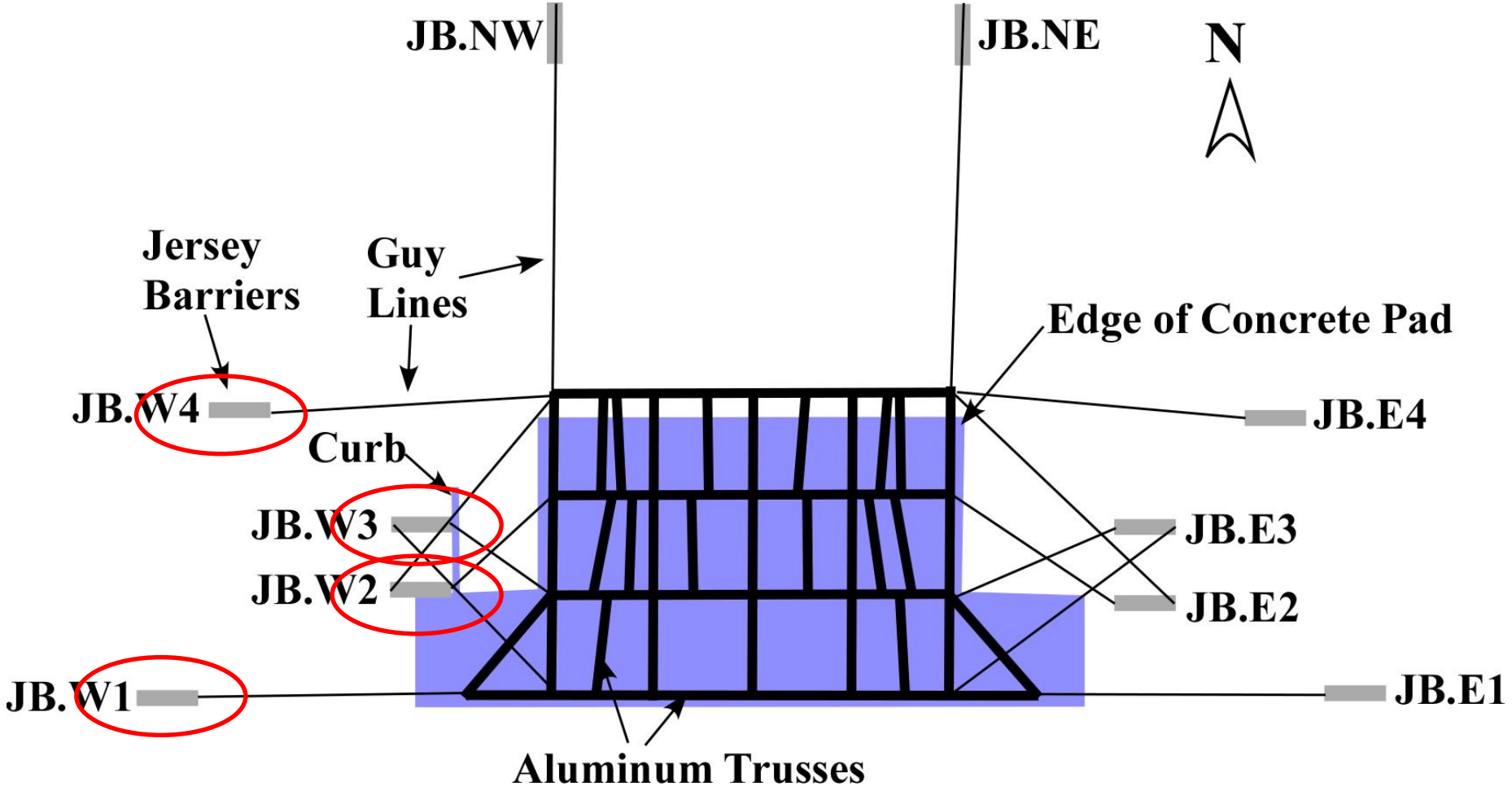
$(F_{fr})_{\max} < T_x$

Triggered the collapsed and caused 7 deaths and 58 injuries!

The *Fatal Friction* [design] *Flaw*



*Looking Down Upon The Structure*



INDIANA STATE FAIR COMMISSION COLLAPSE INCIDENT

Structure Component Identification

Photo 57

Thornton Tomasetti


INDIANA STATE FAIR COMMISSION COLLAPSE INCIDENT
Thornton Tomasetti


YODOCK
INDIANA STATE FAIR COMMISSION COLLAPSE INCIDENT
Structure Component Identification
Photo 59
Thornton Tomasetti


INDIANA STATE FAIR COMMISSION COLLAPSE INCIDENT
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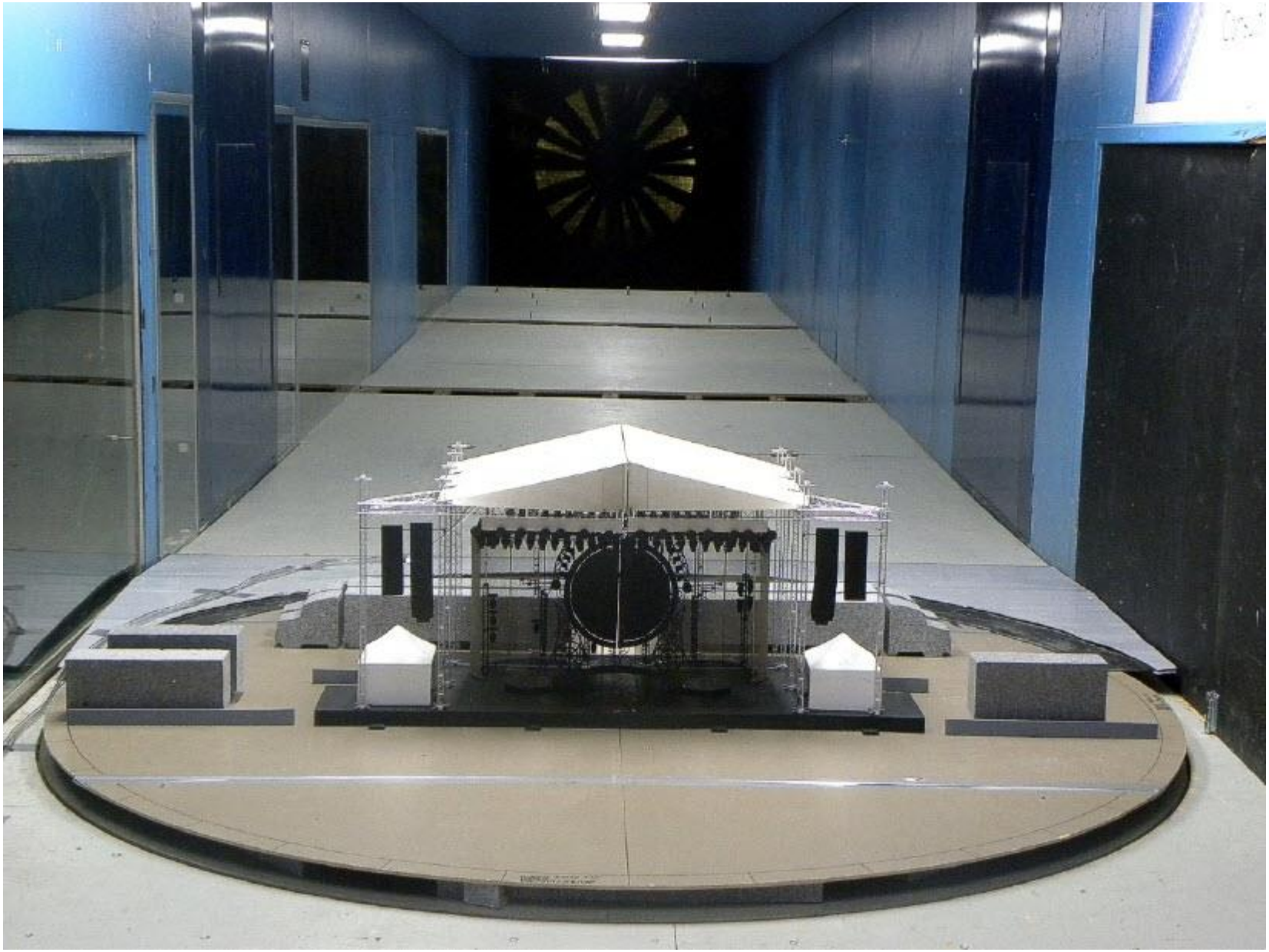

Fig. 6 Fin plate mechanical test setup

Fig. 8 Failure of fin plate F4 EAST

## Thornton Tomasetti, Inc.

### Key Findings

- Lateral Load
- Falls Short of Most Standards
- Straps, Ratchet, and Cables
- Fin Plates


WARNING
THIS BUILDING
MUST BE
EVACUATED WHEN
WIND SPEEDS
REACH 35 MPH
BY ORDER OF THE
WI STATE DEPARTMENT
OF COMMERCE

In summary...

**Can't withstand 109 km/hr wind?**

**Insufficiently secured or built.**