

WCIA Television Tower Ice Shield

Seymour, Illinois

Client: WCIA, Channel 3, Champaign, IL,
 Fabricator: Kurland Steel, Urbana, IL



Range of Services

- ▶ Structural planning to evaluate options
- ▶ Computer analysis and design, plus field coordination

Project Overview

The challenge presented by the client was to design an ice shield to protect a large dish antenna at the 270 foot level of the guyed 950 foot tall trussed tower. Ice build-up on the truss elements could, and often do, break free and drop from the upper levels of the tower. The criterion selected was to design the ice shield to absorb and deflect a cubic foot of ice falling 50 feet. The impact from such a fall would have damaged the ice shield and the tower the shield was attached to. The solution was to utilize energy absorption by deformation and reduce the impact to manageable magnitude. The following techniques were incorporated:

1. Make the surface of the shield curved to deflect the ice.
2. Make the surface rough to break up the ice, such as expanded metal lath.
3. Employ shock absorbers at the end of the tension rods that supported the shield to deflect a large amount and reduce the impact.
4. Make the structural elements of the frame out of tubes to allow for greater torsion resistance.

The End Result

This solution satisfied all the requirements to make the tower safe from localized structural collapse under the impact. The ice shield was installed in 1983 and still protects the dish antenna today. The overall tower image shows the ice shield in place, while the closer image is while the ice shield is being lifted into place. The other images are of the shield during fabrication, and the isolators used as shock absorbers.



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