

Building Code Exemptions for Agricultural Buildings

Minnesota Governor's Council on Fire Prevention and Control

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Introduction

The Governor's Council on Fire Prevention and Control dates back to the 1969 Legislative Session and operates today under Executive Order No. 03-04 signed by Governor Tim Pawlenty on April 4, 2003.

Synopsis

This White Paper intends to discuss the risks associated with the exemption from the state building code for agricultural buildings.

Definitions

The purpose of Minnesota's Building Code is spelled out in Minnesota Rules 1300.0030, subpart 1, which states ***"[t]he purpose of this code is to establish minimum requirements to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to firefighters and emergency responders during emergency operations."***

While the building code applies statewide, in subpart 2A, the rules also state the building code does not apply "to agricultural buildings" with limited exceptions in the case of floodplain management and electrical installations.

Minnesota State Statutes Section 326B.103, subdivision 3 defines an agricultural building as ***"a structure on agricultural land...designed, constructed, and used to house farm implements, livestock, or agricultural produce or products used by the owner, lessee, and sublessee of the building and members of their immediate families, their employees, and persons engaged in the pickup or delivery of agricultural produce or products."***

The Minnesota Department of Labor and Industry is the state agency responsible for enforcing compliance with the state's building code. The agency has ruled that to qualify for an agricultural exemption from the state building code, a two-part test is required where both the structure and the land must meet the qualifying definitions.

Minnesota State Statutes Section 273.13, subdivision 23, paragraph (e), is part of the property tax code that defines agricultural land as ***“contiguous acreage of ten acres or more, used during the preceding year for “agricultural purposes.” Agricultural purposes as used in this section means the raising, cultivation, drying, or storage of agricultural products for sale, or the storage of machinery or equipment used in support of agricultural production by the same farm entity.”***

Under paragraph (f) of the same subdivision, ***“real estate of less than ten acres, which is exclusively or intensively used for raising or cultivating agricultural products, shall be considered as agricultural land.”*** There are some additional requirements if the land also contains a residential structure.

The Department of Labor and Industry points out that building officials should rely on how the property is classified according to the records of the county assessor’s office, when determining if a property qualifies for an exemption to the building code.

The Minnesota State Fire Code does not specifically define an ‘agricultural building’ and as such agricultural buildings have no specific exemption from the fire code. However most agricultural structures are classified as a Group U Occupancy, which is a miscellaneous category. Group U structures do have many specific exceptions from fire code requirements, which include no specific requirement for access to water, fire sprinklers, fire detection systems or portable fire extinguishers, among other exceptions.

Background

The first model building code in the United States was published in 1905 by the National Board of Fire Underwriters, an insurance group. In response to devastating fires that destroyed large sections of Boston, New York, Chicago, Baltimore and San Francisco in the late 1800s, insurers began to look at ways to help mitigate large-scale fire loss.

In 1894, tragedy struck closer to home when the town of Hinckley, Minnesota was destroyed by a forest fire that spread quickly amongst the town’s almost entirely wooden structures. The fire burned 307,000 acres and killed 418 of the town’s 1400 people.

What began as a small effort to quell large urban fires in the early 1900s has grown into an international effort to establish minimum standards for design, materials, construction, inspection, use, location and maintenance. Most state and local building codes are patterned after national and international model building codes. Most states adopt the codes as part of their state government administrative codes.

Because the largest of the devastating fires were primarily in large urban areas, the push to adopt uniform building codes generally did not include rural structures, particularly since the loss of an agricultural building seldom leads to a loss of human life. Rural buildings are also generally somewhat isolated so fire doesn't usually spread to a large number of other buildings.

That being said, Minnesota does see its share of large losses in agricultural structures. From 2006-2008, the state saw 521 fires in agricultural buildings with an estimated loss of more than \$25-million. As agribusiness continues its path toward more and more consolidation of facilities, there are increasingly more and more single fires with losses in excess of \$1-million.

The large average loss is primarily a result of the unique challenges faced when fighting fires in rural areas. Travel times for rural, volunteer, paid-on-call fire departments to such fires tend to be long. The access to water is often uncertain and some rural buildings can be very large. Almost half of these fires are from unknown origin. The largest known cause is from open flames, embers or torches, which account for about 15% of agricultural building fires.

Issues

While the complexity and reach of building codes have expanded dramatically over the last 100 or so years, the agricultural exemptions have largely stayed in place. However in recent years, the farming profession has begun to morph away from the small traditional family farm toward larger more professional agribusinesses that have higher volume, more complex operations. These businesses are sometimes run by large national and even international corporations. Typically larger corporations have a better understanding of risk mitigation and all of the tools necessary to reduce losses. Many have large staffs devoted to loss management. In light of the changing nature of agricultural economics this is a very appropriate time to re-evaluate the need for agricultural exemptions to the state building code.

Over the past several years, Minnesota insurers have paid many multi-million dollar claims on large agricultural buildings that were exempt from state building codes. These buildings were lost due to a variety of causes including snow load, windstorms and fire. While impossible to quantify exactly, these buildings most assuredly would have suffered smaller losses had they been required to either adhere to the applicable construction codes or comply with a reasonable deviation from the codes. Since claims payouts are a direct driving force in premiums charged, lowering claims payments by any means would have the effect of keeping property insurance premiums in check.

Examples of Recent Losses



Snow Load Loss in Hog Confinement Building



Snow Load Loss in Hog Confinement Building



Fire Loss in Hog Confinement Building

While there hasn't been a case of a loss of human life yet, many agricultural buildings, which are exempt from the state building code, are serving increasingly as places of employment. Increasing the number of workers in exempted buildings dramatically increases the risk that a loss of life tragedy could occur. Such a tragedy would be easier to prevent by requiring certain agricultural structures to either adhere to the state building code or comply with a reasonable deviation from the codes.

A major driver in the debate over whether to include agricultural buildings in the state building code is cost. It simply costs more to build a structure to code. Having a stricter standard for design, engineering, materials and workmanship leads to higher costs. The higher cost is ultimately passed along to consumers.

Exempting a building from the state building code gives farmers more choice when deciding which structures to include on a farm. With an exemption, the farmer can avoid code-required planning, code required construction requirements, review and on-site inspections.

The biggest way for farmers to reduce costs of an agricultural structure is to purchase one with design loads that do not meet the code-established minimums. While such buildings cost less to purchase, they are also at much higher risk for loss. However, farmers will assume the higher risk because it is very easy to pass that risk onto their property insurer. This scenario would find farmers purchasing the lowest price building that their insurer will cover at a reasonable price. Eventually the money saved could find its way to consumers in the form of lower food prices since the farmer paid less in building costs and the insurer is carrying the loss risk costs.

There are clearly benefits of regulation, particularly the adoption of building codes. The process includes proper design (by a licensed engineer or architect) and review by government entities before construction begins. The code helps to ensure a minimum structural performance level is met by requiring all structural buildings to withstand certain minimum specified loads. In as much as funding for governmental review or oversight may become an issue, oversight based upon the requirements of the State Board of Architects, Engineers, Land Surveying, Landscape Architecture, Geoscience, Interior Design for the Architects and Engineers should provide appropriate construction observation.

Buildings can generally be categorized as fully-engineered, partially-engineer or non-engineered. Many buildings that are subject to building codes are generally fully-engineered, where the interaction of all the structural components is taken into account during the

structural analysis. The forces that result from the analysis are used to help calculate the size needed of the structural components.

A non-engineered structure most likely lacks the accounting for the component load or strength of its structural members.

A partially-engineered structure is a design that is in between these two extremes. Most new agricultural buildings would likely be classified as partially-engineered, primarily viewed as more of a collection of independently acting elements and less as an overall structural system.

On one end of the spectrum are buildings that are designed with engineering limited to designing a truss that withstands snow and dead loads. The effect of wind force is not typically considered, nor are mechanical connections sized. Higher level interactions are generally ignored.

As noted earlier, non-engineered structures have a higher risk of failure than fully-engineered structures. The risk rises in larger buildings because the number of structural elements is related to size. The more structural elements, the higher the probability that some component will fail (because there are simply more of them).

Similar to the design flaw that allegedly doomed the I-35W Bridge in Minneapolis, many non-engineered buildings do not have redundancy in their structural elements. If one member or connection in the roof fails, the entire roof is jeopardized. A collapse could trigger a total loss.

A structural collapse of these agricultural buildings leads to a greater economic loss than just the building's replacement cost. Remunerable expenses will most likely include equipment and animal replacement, loss of potential business income, demolition and rebuilding.

Competition in the marketplace may also be driving lower designed load levels. Farmers attempting to minimize costs as a competitive advantage may be demanding buildings with less structural integrity, knowingly or unknowingly. Some farmers solely consider costs when purchasing a building and building manufacturers face increased pressure to design load levels that fit the farmer's desired price range. A manufacturer that doesn't fulfill farmers' requests could see smaller market share.

However, building designers have the benefit of plenty of experience to learn from and can use updated techniques to improve the quality of their structures.

Because building codes exempt agricultural buildings, designers are able to amass real world comparisons in the performance of fully-engineered versus non-engineered structures. The lessons learned can turn a loss into a dramatic improvement in future designs.

Also in recent years, technology in structural integrity, redundancy, fire hardening and fire detection has made tremendous gains. As the cost of these systems comes down, it will become increasingly affordable to include fire protection features in an overall risk mitigation package.

Considerations

There are many challenges and questions to consider when evaluating the state building code exemption for agricultural buildings.

They include:

- Life Safety
 - Occupants
 - Firefighters
- Economics
 - Cost of Construction
 - Cost of Insurance
 - Cost of Enforcement
 - Cost of Firefighting
- Competitiveness
- Ability to Enforce Through Plan Reviews and Inspections
- Education of End Users and Building Officials
- Maintaining Designed Structures and Preserving Their Fire Detection and Hardening Elements
- Complexity of the Code and Potential Changes to it
- Unintended Consequences

- Retrofitting
- Participant Backlash
- Difficulty in Implementing
- Political Will
- Ability to Collaborate

Life Safety. This is obviously the most important reason to consider changes to the current exemption and yet the hardest to calculate when attempting a cost-benefit analysis in maintaining the current system.

Economics and Competitiveness. Code compliant structures are more expensive to build because of the additional cost to design and because of the additional materials required. These additional costs can be initially difficult to justify, particularly if adoption is not uniformly accomplished. Agribusiness, especially on the wholesale level, is a low margin industry with inconsistent capital inflows.

The cost of construction and enforcement would be higher without the exemption, but the cost of firefighting and the cost of insurance would be lower.

While the cost challenge is one of the most difficult to address since it is likely to be one of the largest reasons for opposition, it also is tempered by the fact that code compliant structures should be less expensive to insure because of the lower risk. The risk-reward curve is often difficult to understand for decision makers.

The traditional insurance model finds that lowering risk would equate to lower premiums. Some insurers, however, are sometimes willing to assume more risk on their own in an effort to lower premiums so they can gain market share. This imbalance in the risk-reward curve can lead to confusion among policyholders in the marketplace as they find insurers willing to write lower cost policies on higher risk properties. But this imbalance can only be temporary. Once higher risk properties begin making larger claims, insurers tend to right the ship and more properly align premium billings to risk assumed.

It will be important for policymakers and policyholders to understand the long term significance of what an elimination of the exemption would entail, i.e., higher costs in the short term and lower costs in the long term.

Ability to Enforce/Education of End Users and Building Officials. There already exists in Minnesota a hardship in ensuring building codes are adhered to. There aren't enough enforcement officials in parts of Greater Minnesota. And, agricultural producers sometimes have a distrust of outsiders telling them what to do. But an effort can be made to educate farmers and others why building codes are so important to protect lives and property from loss.

An education process would be long and complex, so it would need a smart, thorough implementation period.

Maintaining Designed Structures and Preserving Their Fire Detection and Hardening Elements. Even if the agricultural exemption from building codes were lifted, there would be a tremendous challenge in making sure that once built, code compliant structures maintained their design elements and that the fire detection and fire hardening elements are maintained. Oftentimes, agricultural buildings are constructed in phases. There would need to be an effort to continue to enhance the education of farmers and building officials to make certain that all involved understand the importance of compliance.

Code Complexity/Unintended Consequences/Difficulty in Implementing. Requiring all agricultural buildings in Minnesota to comply with the state's building code is a significant departure from the status quo. It would take a great deal of time and effort to design a system that would complete the process from beginning to end. It would start with a campaign to educate legislators and state officials on the issue in order to enact legislation that would enable the initiative to be adopted. The adoption process would need teams of experts to write the appropriate legislation and rules. Because the code is very comprehensive, the vetting process is extremely important to avoid affecting other areas that were not intended.

Participant Backlash/Opposition. All stakeholders would need to have an adequate voice in ensuring their concerns are addressed and there would need to be extremely competent and patient leaders to help evaluate the comments and concerns and be able to fairly adjudicate disputes along the way. There is a very good chance that not all the areas of concern would be able to be addressed in a manner that would satisfy all affected parties.

Political Will. Agribusiness trade groups are among some of the most politically powerful organizations at the Capitol. They have representatives in nearly every part of the state, so their influence over a large number of lawmakers is difficult to match. But the fire service and building code community is also large and widespread, with a great deal of credibility earned through years of community service.

Since success in the legislative and regulatory arenas is not something that happens overnight, any attempt to make a significant change in the state's building code will require a strong, well planned, long-term effort.

Ability to Collaborate. The key to success in any endeavor to make a significant change in the state's building code is to make certain enough input is gathered from every affected group. Understanding divergent concerns and being able to alter outcomes in a rational, effective way is essential. Recognizing that not every stakeholder will deem their input a success, it will be important to remain tactful, yet firm, in dealing with dissent with an eye toward achieving as much consensus as possible.

Conclusion

Despite the many obstacles that lie in the way of any effort to alter the agricultural exemption to Minnesota's State Building Code, there remains a compelling public interest to maximize the safety of citizens and property that outweighs many of the stated concerns.

There also doesn't have to be an 'all or nothing' approach. There can be creative ways to accomplish the goals, such as smartly redefining certain agricultural buildings that are higher risk and making those buildings comply or other options, like continuing the exemption but only on smaller structures, etc.

There are a wide variety of uses for agricultural and commodity buildings being employed in today's farm economy. Better identifying which types of buildings could or should qualify for stricter standards would help alleviate many concerns and further solidify the necessity for any changes.

It will also be helpful to gather real world data on the difference in cost between buildings constructed today with whatever scenario emerges as a consensus, so that proper comparisons can be made.

Whatever decisions are eventually made, it is very important that every stakeholder understand the process is starting from square one. There should be no pre-determined outcomes and no assumptions made, other than that a rational analysis be attempted for justifying the continuation of the exemption for agricultural buildings under Minnesota's State Building Code.

Sources:

Bohnhoff, David. "[Exemption to the Rules.\(farm building codes\)](#)." Resource: Engineering & Technology for a Sustainable World. American Society of Agricultural Engineers. 2001.

Disclaimer:

The Governor's Council on Fire Prevention & Control is made up of 15 organizations that each has an impact on fire prevention and control outcomes in Minnesota. The development of a White Paper by the Council is an attempt to provide an overview on an issue that has been deemed important to fire prevention and control. While generally accepted, it is not intended that every concept in this White Paper is wholly endorsed by all of the member organizations.