

January 1995

92 FCR 008

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PROTECTION AGAINST MECHANICAL DAMAGE FOR ABOVEGROUND STORAGE TANKS

Issue:

Standata 92 FCR 002 requires all aboveground flammable liquid and combustible liquid storage tanks that are not enclosed by a dike to be protected against mechanical damage.

There are no specific requirements for barriers in the Fire Code, therefore, what are acceptable barriers?

Background:

Standata 92-FCR-002 included the need to protect aboveground storage tanks against mechanical damage. The Standata does not address the size, shape or configuration of acceptable barriers.

Underwriters Laboratories of Canada (ULC) published standards for contained and protected aboveground storage tanks contain installation criteria for barriers.

For example, the ULC standard on protected tank assemblies states:

Requirements for the protection of the **protected tank assembly** against damage from vehicular traffic e.g. either bollards (concrete filled NPS 6 Schedule 80 steel pipe) or standard highway guard rails placed at a minimum distance of 1.5 m from the **protective encasement** perimeter in such a manner as to prevent vehicular passage.

Each ULC standard identifies only two types of barrier. Each standard has slightly different criteria and presents the two types of barrier protection as examples.

In addition, there are other standards that have established safe practice. These are found in the Propane Installation Code and are used for collision protection for aboveground propane tanks.

Code Requirements:

4.3.3.4. Protection Against Mechanical Damage. An *inspector* or *local assistant* may require that an aboveground *storage tank* be provided with barriers, if there is potential for mechanical damage to the *storage tank* from vehicles or other sources.

ISSUE OF THIS RULING IS AUTHORIZED
UNDER ARTICLE 1.1.4.4. OF THE ALBERTA
FIRE CODE 1992 BY THE SENIOR TECHNICAL
OFFICER, FIRE STANDARDS.

C.M.TYE



RULING:

Barriers for aboveground tank installations are to be designed by a professional engineer. Examples of acceptable barriers are:

1. Concrete set, 200 mm treated posts with a beam guard rail, set at 1 m from the tank shell with the posts being spaced 1 500 mm on centre.
2. Concrete set and filled 100 mm schedule 40 pipe, set at 1 m from the tank shell with the posts being spaced 1 500 mm on centre for service station application where no heavy vehicles are expected.
3. Concrete set and filled 150 mm schedule 40 pipe, set at 1 m from the tank shell with the posts being spaced 1 500 mm on centre for cardlocks where medium sized truck traffic is expected.
4. Concrete set and filled 200 mm schedule 40 pipe, set at 1 m from the tank shell with the posts being spaced 1 500 mm on centre for bulk plants and other industrial occupancies where large sized truck traffic is expected.
5. Reinforced 100 mm concrete posts, set at 1 m from the tank shell with the posts being spaced 1 500 mm on centre for service station application where no heavy vehicles are expected.
6. Reinforced 150 mm concrete posts, set at 1 m from the tank shell with the posts being spaced 1 500 mm on centre for cardlocks where medium sized truck traffic is expected.
7. Reinforced 200 mm concrete posts, set at 1 m from the tank shell with the posts being spaced 1 500 mm on centre for bulk plants and other industrial occupancies where large sized truck traffic is expected.
8. Steel deep beams 300 mm x 4 100 mm supported by 160 mm pressure treated wood posts located not more than 1 900 mm on centre with the top of the beam not more than 600 mm above grade, with the barrier spaced a minimum of 500 mm from the tank shell.
9. Reinforced concrete "New Jersey Turnpike" barriers not less than 750 mm in height and the width of the base not less than the height of the barrier spaced 500 mm from the tank shell.

Alternatives for barrier protection are acceptable provided they are designed by a professional engineer and meet the intent of protecting aboveground tanks against mechanical damage.