

CONCRETE STORAGE TANK COVER SLOPE AND PONDING

Rule Affected: Title 30 Texas Administrative Code (30 TAC) §290.43(c)

Background:

The first rule revision to stipulate that storage tank covers must be sloped to prevent the collection of water was published in 1967. In 1988, the rules were revised to require that tanks shall be designed and erected so that no water ponds at any point and that no area of the roof shall have a slope of less than 0.75 inches per foot.

The purpose of the sloped roof requirement is to protect the structural integrity of the tank by preventing significant and prolonged incidents of standing rainwater. Standing water adds unnecessary weight and leads to external corrosion of the tank cover. External corrosion can potentially allow contaminants to infiltrate the tank and compromise the stored water's quality. Although concrete tank covers are generally not prone to corrosion, the added weight of ponding water and the potential for the introduction of contaminants are still of concern.

Guidance:

An exception can be granted for existing concrete tank covers with a positive slope of less than 0.75 inches per foot provided that:

1. Within hours following each rain event, the water system staff must inspect the roof to ensure that no ponding of water has occurred. If ponding has occurred, the excess water must be swept off the roof.
2. Surface cracks greater than 1/32-inch in width shall be repaired with a high-pressure epoxy injection grouting system. Any acceptable method of repair must be compliant with *American Water Works Association (AWWA) D110 Section 5.14* (see also *American Concrete Institute [ACI] 350R—Environmental Engineering Concrete Structures*). The surface of the crack shall then be finished flush with the adjacent surfaces and shall show no indentations. The repair work shall be guaranteed by the repair contractor against failure of the epoxy bond in the repair areas for a minimum period of one year.
3. In small areas of honeycombed or spalled concrete (pits), the repair of the defect must include the application of non-shrink aggregate grout bonded to the concrete with an epoxy bonding agent. The minimum strength of material used in the repair shall equal or exceed that specified for the concrete. The surface of the pit shall then be finished flush with the adjacent surfaces and shall show no indentations. The repair work shall be guaranteed by the repair contractor against failure of the epoxy bond in the repair areas for a minimum period of one year.

STEEL STORAGE TANK COVER SLOPE AND PONDING

Rule Affected: 30 TAC §290.43(c)

Background:

The first rule revision to stipulate that storage tank covers must be sloped to prevent the collection of water was written in 1967. In 1988, these rules were revised to require that tanks shall be designed and erected so that water does not pond anywhere on top of the tank and that no area of the roof shall have a slope of less than 0.75 inches per foot.

The purpose of the sloped roof requirement is to protect the structural integrity of the tank by preventing significant and prolonged incidents of standing rainwater. Standing water adds unnecessary weight and can lead to external corrosion of the tank cover. External corrosion can allow contaminants to infiltrate the tank and compromise the stored water's quality. Additionally, bolted or welded steel roofs are prone to localized deformation caused by expansion and contraction due to temperature, climatic conditions and human activity. Even walking across a steel roof may cause localized deformation between roof supports which can lead to water ponding, regardless of whether or not the tank was initially designed and constructed with a proper slope.

Guidance:

An exception can be granted for steel tank covers with a slope near the minimum slope of 0.75 inches per foot with the following conditions:

1. Within hours following each rain event, the water system staff must inspect the roof to ensure that no ponding of water has occurred. If ponding has occurred, the excess water must be swept off the roof.
2. No breach or opening exists in the roof of the tank; and
3. The potential for water ponding is minor and is not sufficient to cause damage to the exterior coating or surface of the tank.

Finalized and Approved by:

Ada Lichaa P.G., Plan and Technical Review Section Manager, 09/23/2013

If no formal expiration date has been established for this staff guidance, it will remain in effect until superseded or canceled.

Revision History:

Date	Action	Action by
xx/xx/2009	Approved	Elston Johnson
12/05/2012	Revised	David Williams
08/14/2013	Revised	Yadhira Resendez
09/23/2013	Approved	Ada Lichaa
6/10/2014	Revised Format	Tamira Konkin-Garcia