

Constructing poultry barn floors

This fact sheet addresses construction and operation of poultry barn floors. Before beginning construction of a poultry barn, you need to obtain the appropriate permit from the Minnesota Pollution Control Agency (MPCA) or delegated county feedlot officer.

Concrete or asphalt floors

The completed floor thickness must be a minimum of:

- 3.5 inches for concrete
- Two inches for asphalt

The floors must be inspected after each cleaning and any cracks and joints, which may extend through the floor, must be sealed. In addition, you must repair any other damage that results in a decrease of floor thickness.

Earthen floors

Pre-construction requirements

Prior to construction of an earthen poultry barn floor, you must ensure that soils at the site meet the minimum requirements of Minn. Rule 7020.2120.

Pre-construction testing will be needed to verify the soils used for the construction of an earthen poultry barn floor meet all of the following:

- At least 30% passing a number 200 sieve, less than 20% retained on a number 3 sieve, and no rocks greater than three inches in diameter according to ASTM-D-422
- Plasticity index greater than 7% according to ASTM D-4318

Earthen poultry barn floors must also be located so that the entire floor is at least 3 feet above the seasonal high water table elevation or bedrock. Pre-construction verification of separation to water table or bedrock can be done via information within the United States Department of Agriculture soil survey or obtained during a pre-construction soil investigation.

Below are recommend practices to ensure that the soils at the site are adequately evaluated.

- A minimum of two soil borings/pits/samples (investigations) within the boundaries of the proposed building site for the first 1/2 acre of barn surface area. One additional investigation should be taken for each additional one acre of barn surface area.
Example: a 50' x 650' barn will have a surface area of 0.75 acres should have three investigations.
- Investigations need to represent the range of soil conditions throughout the barn area.
- The elevation and location of each investigation, relative to the site, should be recorded.
- When needed to determine the depth to seasonally saturated soils or depth to bedrock the investigation should be advanced a depth of at least 5 feet below the elevation of the floor.
 - Investigations to determine the depth to seasonally saturated soils should include interpretation of soil colors (mottling) and identification of redoximorphic features.

Documentation of soils investigations or soil testing results are not required as a part of a feedlot permit application but such information can be requested by the MPCA or delegated county feedlot officer (CFO) prior to permit issuance.

Construction requirements

The soils must be placed as follows during construction:

- Minimum of two lifts, each lift being a minimum of four inches of in-place thickness
- Moisture content of 0-5% above optimum as determined by ASTM D-698 or ASTM D-1557
- Compacted with at least three passes of a sheepsfoot or padfoot-type compaction equipment with feet that extend through the loose lift of soil into the previous lift

NOTE: Other methods of compaction can be used provided they can achieve 90% of standard proctor density. When other methods are used, compaction must be verified according to ASTM D-2922, at a frequency of one sample per 3,000 square feet.

The thickness of the completed soil floor must be at least 12 inches. The floor thickness may be reduced to 8 inches of compacted soil if there is a constructed underlayment that consists of either of the following:

- Three inches of sand consisting of at least 80% passing a number 4 sieve, less than 10% passing a number 200 sieve, and no particles greater than one inch. Particle size analyses must be performed according to ASTM D-422
- A geotextile fabric that weighs at least 12 ounces per square yard and has a minimum hydraulic conductivity of 0.30 cm/sec.

Record keeping requirements

You need to record and retain on permanent file the results of all soils testing done prior to and during construction. These records must be made available to the MPCA or county feedlot officer upon request.

Operational requirements

The floors must be inspected after each cleaning and any cracks and joints, which may extend through the floor, must be sealed. In addition, you must repair any damage that results in a decrease of floor thickness of two inches or more. The soils used to repair any damage must meet the requirements outlined above.

The floor must not be saturated at any point during the service life of the floor.

Polyvinyl chloride (PVC) lined floors

While not common in Minnesota, a seamless, or factory seamed, PVC liner of at least 30 mils with a protective material overlay of at least 6 inches can be used for poultry barn floors as well. The material used as an overlay must be consistent with the PVC liner manufacturer recommendations and not consist of particles that may damage the liner. Integrity of the PVC liner and thickness of cover material must be maintained throughout the service life of the floor. Any damage to the PVC liner should be repaired in accordance with the manufacturer recommendations.

Construction notifications

For all types of poultry barn floors you need to notify, by phone or email, the entity that issued your permit (MPCA or CFO) at each of the following times:

- Three business days prior to commencement of construction of the floor
- Within three business days following completion of construction of the floor

For more information

For more information about the feedlot program or feedlot rules refer to the feedlot program page at: www.pca.state.mn.us/feedlots.

For information on stockpiling of manure after removal from the barn, refer to the fact sheet titled “[Technical Guidelines for Stockpiling of Manure](#)” available at: www.pca.state.mn.us/water/land-application-manure.