

The Correct way to install non-slip concrete flooring in dairy barns

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INTRODUCTION:

Farmers, Builders and Dairy Specialists are designing in and building barns with flooring that leads to various foot and leg problems shortly after occupancy. In addition, as alley scrapers/skid steers etc. do their work over the years, these floors become smooth to the point that the cattle start to slip and fall, incurring serious injury. Veterinarians, and dairy herd specialists have been writing about these problems and making recommendations for years, and barns are still being built with problem floors. Efforts to save dollars by cheaper methods of providing "poured/stamped in place traction" at the time of construction are soon lost through veterinary bills, farm operators time and the cost of medical supplies needed to treat hoof and leg injuries, not to mention milk production losses, and highly productive aging cows being culled prematurely. Dairy farmers are calling in Grandview Concrete Grooving (gcg), to correct problem floors a few years after construction. GCG installs excellent traction into new barn floors that qualifies with all recommended specifications as suggested by all the experts that have written on the subject.

The authors are in the business of diamond wheel grooving concrete surfaces of cow barns. This discussion paper arises from observations the authors have made in the course of their work, coupled with researching the considerable literature on the subject.

This paper is focused at dairy farmers who are considering renovating existing facilities or building new free stall barns; the general contractors/builders; the concrete contractors and the agricultural extension dairy specialists responsible for advising them all.

Concrete flooring in all dairy barn animal traffic areas and milking parlours must be of a non slip characteristic to provide the cattle the security they need to move about for feed, water, rest, showing heat as well as coming to and leaving the milking area. There are two major areas of discussion that need to be addressed;

- 1) Diamond wheel grooving concrete floors that have become slippery.
- 2) Installing fresh concrete with poured in place grooves and roughened surfaces between these grooves.

THE DISCUSSION:

- 1) DIAMOND WHEEL CONCRETE GROOVING IS THE METHOD that has been employed

for over two decades to renovate concrete floors that have become too slippery due to the polishing effect of daily scraping manure from pens and alley ways, year in and year out. More and more dairy farmers are electing to cut grooves into brand new barn floors.

See later in this paper "**There is a Better Way**".

2) Fresh concrete with" poured in place grooves" This practice has been employed by dairy farmers for a few years now as a cheaper way of providing non slip characteristics to their floors. Various methods are utilized to achieve this textured flooring involving pressing, rolling or dragging some form into the wet cement to leave the desired pattern. Veterinarians have written many articles over the years describing the injuries to cattle hooves caused by these efforts. (Ref. Hoard's Dairyman Feb.10,1982-Dr. John McCormac DVM.Extension Veterinarian University of Georgia). In his article entitled "Nutrition and Concrete bring on Foot Problems" - he says- "Concrete should be smooth and grooved rather than roughened". " Take a look at new rough concrete. Get down on yours bare knees and run your palm over the surface and you'll see how it must feel to the cow". (ref. Hoards Dairyman, October, 1995 - Dr. James A. Jarrett, DVM. Large animal practitioner specializing in herd health programs, Rome Georgia). His article was entitled "ROUGH CONCRETE WAS MAKING COWS LAME". Here he talks about a new 500 head, free stall set up, where the contractor put in a "broom finish" on the cow traffic areas. Cows were turned into the new facility and "after three to four weeks, dry matter intake began to fall, followed by dramatic rise in the number of lame cows showing evidence of pain when they walked. On examination, the bottoms of the feet appeared to have been ground away by some abrasive machine to the point where several were bleeding from the sole". Further, Dr. Jarrett says "It is my standard recommendation that, in confined housing facilities, the concrete should be rough but not abrasive the micro surface should be smooth enough that it does not abrade the feet of the animals as they move about. On the other hand, the micro surface needs to be uneven enough so that there is good footing". The article goes on to recommend dragging concrete blocks over the floors to grind them down to a comfort level the cows could tolerate, then bringing in a grooving contractor to cut in grooves to provide acceptable traction.

Here we have two articles appearing in Hoard's about 13 years apart virtually about the same problem. *Obviously* getting it right is a very difficult thing for the concrete contractor to accomplish. (Ref. Mr. Ted Gribble, 5G Consulting, 32854 S. Dryland Rd. Mollala, Oregon, 97038, USA.). Mr. Gribble says: "Floors should be finished flat and the installation of surface texturing including wide exaggerated grooves, should not be such that would cause interdigital distortion leading to undue flexing of the tissues between the cleft hoof". Standard 1/2" wide DIAMOND WHEEL GROOVING on flat finished concrete meets all the qualifications for safe trouble free cattle flooring.

THE PROBLEM WE ARE ASKED TO CORRECT

We have been called onto farms to correct slippery cattle traffic areas of all kinds. Most of these are old existing barn floors that were installed with no thought to the wearing down affect of skid steers,

loader, or alley scrapers. More recently, GCG. are being contracted to come in on modern free stalls where "poured in place" grooves and "between groove texturing" (jitter bugging) have been formed into the wet cement. The grooves in these barns are usually marked into the wet cement long ways of the alley and the texturing is put between the grooves with various methods creating a ridge pattern as an attempt to catch the hooves. We also see stamped in place grooved floors where grooves are pressed into the wet cement creating a pattern of squares ranging from 4"-5" up to 10"-12" with grooves 1"- 2" wide between.

Another method we have seen being used in newer barns is just putting the ridge textured surface in the wet cement in a slight herringbone pattern with what looks like a chopping motion with the final screeding off of the cement. These systems of "poured/stamped in place" texturing work for a little while. However, after 3 to 4 years of scraping, there is not much grip action left as the ridges become what is better described as smooth undulations. As the poured or stamped grooves do not have the good sharp edges of DIAMOND WHEEL GROOVING they are not functioning well in holding the hooves either. As just mentioned, the ridged surfaces have become worn down to where they are now an undulating smooth and very slippery surface.

HOW DO WE CORRECT THE SITUATION?

GCG comes in and cuts a herringbone grooved pattern 1/2" wide X 3/8" deep every 3 1/2" cross-ways in the alley in the barns where the grooves were "poured in place" long ways and GCG cuts a diamond groove pattern into the alley in those barns where no long ways grooves were moulded in at the time of the pour. These grooves now will engage the hooves of the cattle, and prevent them from slipping and falling. Cut grooves remain square and sharp for the life of the floor.

THERE IS A BETTER WAY

Grandview Concrete Grooving now feel confident to; (based on their observation made in the field and the dramatic success of our correction techniques, coupled with the researching of pertinent literature, and expert professional opinions canvassed on the subject) recommend all principals involved in the business of dairy barn construction to:

1. POUR all concrete cow traffic areas to the specified grade taking care to finish surfaces flat. A flat scraper on a flat floor cleans...cleanest! We recommend floors be poured with a minimum 1/2% slope, in the direction of manure flow. On a sloped flat floor with diamond pattern grooving the floor is tile drained in 2 directions @ 4" centers....thus a cleaner drier floor.
2. POUR DRY AS POSSIBLE – THE DRIER THE STRONGER
MINIMUM SLOPE 1/2 % to END OF BARN or TO CENTRE OF BARN OR BOTH

SCREED CONCRETE OFF & DARBY OUT SCREED MARKS

IF SAND BARN, YOU'RE DONE

FOR ALL OTHER BEDDINGS - BROOM FINISH WITH NO STONES STICKING UP

3. SPECIFY a good strength of concrete that will stand up to years of scraping. DO NOT WATER THIS FORMULA DOWN FOR CONVENIENCE OF WORKING CEMENT. THIS WILL GREATLY DECREASE THE STRENGTH OF THE CONCRETE
4. **CALL in a grooving contractor** after a minimum 14 days curing time to diamond wheel cut sharp-square diamond groove patterns into all cow traffic areas.

See the last page SHOWING a flat concrete surface with sharp 1/2" wide grooves cut in a diamond pattern with diamond wheel cutting machinery. This provides absolute positive hoof to flat floor contact.

The **Grandview Concrete Grooving** method of inserting two-way diamond wheel cut grooves into cured cement cannot be surpassed by any other method of cement groove installation on the market. GCG's specialized method provides the finest cow comfort available on a concrete surface. GCG's method is superior.

GRANDVIEW CONCRETE GROOVING INC. Also recommends diamond grooving wet slippery cow traffic aisles in tie stall barns to provide maximum slip resistance and ease of cleaning. *GCG* can cut the grooves 1/4" deep in holding areas and angle the diamond pattern in the direction of manure flow to assist cleanup where flushing or hosing down is used for cleaning as opposed to mechanical scraping.