

# FLOORS FOR VEGETABLE WASH, PACK & STORAGE AREAS

## INTRODUCTION

It is easy to ignore the thing beneath our feet, but floors are an important part of produce wash and pack areas that deserve special attention. They can impact efficiency, ergonomics, employee health, worker fatigue, personnel safety, and produce safety. There are also a number of design features involved with these seemingly simple structures that should be considered<sup>1,2</sup>.

No two wash-pack areas are the same. Every farm has different needs driven by different crops, scales of production, layout, existing infrastructure, and management approaches.

Smaller market farms may have a very simple, open packshed design consisting of “four sticks and a lid” used primarily during the summer months. The floor of these structures could be anything: a dirt floor, grass, or gravel surface. If you choose to have a dirt floor, consider laying down weed mat or landscape fabric to create a tidy work environment. It is helpful to consider drainage, specifically providing intentional drains from wash tanks and sinks that direct outflow away from the work area, production areas and bodies of water. The intent is to keep the surface underfoot relatively dry and free of standing water, prevent cross-contamination between drainage water and production areas and to prevent nutrient loading in bodies of water.

Larger farms and those engaged in season extension and winter markets may find benefit from an improved floor, permanent roof and walls. When scaling up, consider the benefits of an enclosed packshed which can provide:

- Protection from the elements as you work further into the shoulder seasons. Cooler working environment in the summer for you, your crew, the produce, and your equipment or warmer (if heated) in the fall, winter, and spring.
- Cleaner environment for handling produce and storing containers. An enclosed space is more “cleanable” as it has doors and windows to keep dust, bugs, birds and other wildlife away from you and your produce.

*This farm considered retrofitting a wash/pack room into an existing barn, but opted for the more expensive, but more flexible route of new construction. The single-story building started with pouring a slab on grade which allowed the inclusion of trench drains. The floor is smooth, but not slippery. Note expansion joints in the floor to prevent cracking. This building houses the wash/pack area, several coolers, break room, and a retail/CSA space.*

- There are several different key elements to a floor that you need to take into consideration when designing your new packshed.

## KEY DESIGN FEATURES

### Solid Surface

The main purpose of a floor is to have a solid, level place to work on. A floor needs to provide a good working surface for you to comfortably stand on, roll carts, and move equipment. The floor needs to be stable and sturdy enough to support these activities.

### Smooth, but Not Slippery

Smooth floor surface enhances cleanability, but it is important to make a distinction between smooth and slippery. This is a delicate balance, especially when the floor surface it is wet. Your floors most likely will get wet since the space is used as wash and pack space. The intent is to avoid having a floor that turns into a dangerous surface where personnel can slip and fall.

### Intentional Water Movement

When designing a wash pack area, consider where the water is going to go once it gets on the floor if it even has to hit the floor. Plan for intentional drains from dunk tanks, spray tables, wash tubs, sinks, or wash lines to prevent standing



water on the floor. Standing water is a personnel hazard and introduces a produce safety risk as well.

## Pitch

One way that water removal can be accomplished passively is to pitch the floor. Plan on  $\frac{1}{4}$ " per foot (2%) to create a surface that will drain easily<sup>3,4</sup> without requiring a need to push the water off with a squeegee, adding one more chore. Keep in mind more pitch isn't always better, much steeper than 2% and it will feel like you are working on a ramp all day.



▲ This farm poured, screed, and floated their concrete slab for a smooth, but not slippery finish. Note how the floor is pitched to a central spot drain. A little residual wash down water is draining from the brush washer to the drain as it should.

## Drainage

Intentional drainage of water from the space can be accomplished by direct drains, trench drain, spot drains or a doorway out of the space. Drains should move water from inside the space to somewhere outside that is away from traffic, production areas, and bodies of water. This may be a municipal sewer system, septic system, a grassy or vegetative strip, or a rain garden that can accommodate the discharge.

## Curbing / Cove

Curbing and cove bases provide an intentional transition between walls and floor to allow for improved water drainage and cleanability. Concrete can be poured to provide "curbing" with a radius that walls can be built upon. Additionally, cove base (rubber or tile baseboard trim) can be installed to seal this corner and improve cleanability between the wall and the floor. This avoids the creation of an open seam which can be challenging to clean since it collects dirt and debris and can "harbor" or hold water and pathogens. "Harborage" sites are places where water and pathogens can enter and be protected from cleaning, and

sanitizing, and drying. This can lead to cross-contamination and can also lead to premature rot of building materials.

Trench drains are in-floor drains that are created using forms when a concrete floor is poured. The trench gets covered with a textured, expanded metal grate that allows water to flow into the trench. The grates are removable to allow for easy cleaning and complete drying of the trench between uses.



## Doorways / Thresholds / Ramps

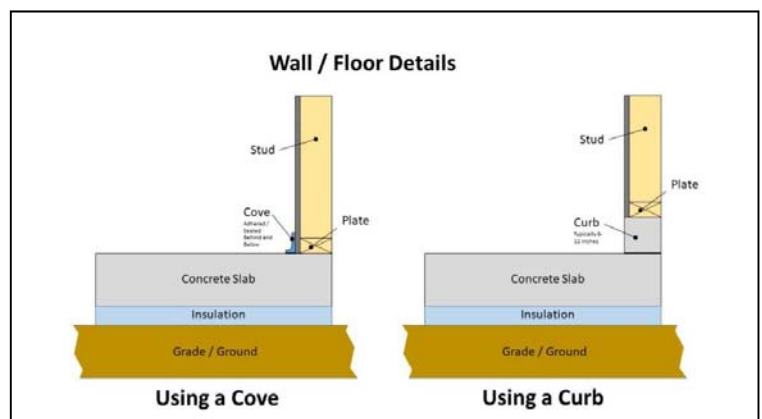
Specific attention should be given to doorways and other floor transitions. Doors may require thresholds for proper sealing (e.g. cooler doors). These thresholds should be well sealed below (between the threshold and floor) to prevent water intrusion and harborage. Additionally, the thresholds may need to provide a gradual transition for hand trucks and other rolling equipment. Sliding or roll-up doors may be preferred since they generally do not require thresholds for sealing, but rather are sealed with a gasket attached to the door.

## TYPES OF FLOORS

There are several different types of floor surfaces to consider.

## Decking

Decking offers a sturdy, durable, smooth, but open surface



▲ Using a flexible rubber cove base (left) or a poured concrete or block curb (right) provides a smooth and cleanable transition between the wall and the floor. A cove can be retrofitted into an existing framed structure. A curb should be considered when pouring a new floor and framing a new building.

allowing flow through for drainage. This may be a simple and cost-effective improvement for an outside wash/pack area currently on bare ground or gravel. Decking is not ideal if product is moved with rolling carts, dollies or pallet jacks. Bare wood should be avoided as decking. Consider composite decking materials or plan to seal the wood with stain or paint.

## Plywood

Plywood provides a more continuous, smooth option when compared to decking. This material is less durable when exposed to weather so providing a roof or other cover should be considered. Plywood offers a smooth surface which will make rolling product cartons, tools and equipment easier. Plywood can also be helpful when trying to covering up and level existing uneven floors. Plywood, inherently, has seams and they can require maintenance to keep watertight. It can also be challenging to clean unless it is sealed.

## Paving Blocks or Patio Blocks

Paving blocks offer a pervious surface that is more solid underfoot than bare ground or gravel. This may be an option for an outside wash/pack area that is used seasonally or is undercover.

## Asphalt or Pavement

Asphalt is a sturdy, waterproof, non-slip, seamless material that may be an option for some wash/pack areas. It may also already exist as a driveway, etc. Installation can be challenging and expensive, and it is not an ideal material for an indoor environment. A coarse-textured surface creates a cleaning challenge, but a fine, smooth surface is possible to achieve.

## Bare Concrete

A concrete slab provides a durable, continuous, smooth surface good for moving heavy bins, equipment, or fork trucks. It can be smooth yet not slippery, not overly porous for cleanability, can be pitched for drainage, can be installed indoors. On the other hand, when unsealed, concrete can absorb moisture, is prone to staining, can be expensive, and once poured it is not easy to modify.

### Concrete Finishing

The finishing of a concrete slab can include several steps that may improve the surface<sup>5</sup>. “**Screeding**” is drawing a straight-edge over the top of the floor while the concrete is just poured to either level it or to achieve the intended pitch (e.g. to drains). “**Floating**” with trowels smooths the top surface and reduces porosity. You can stop here if you’ve reached your desired surface finish or continue troweling as the concrete finishes setting to get a smoother finish. After

floating, you could choose to “brush” the floor which can be done to improve traction instead of troweling. “**Polishing**” is another finishing option but may not be a good choice for a wash and pack area due to the slippery nature of this surface finish.



▲ A bare concrete floor where only screeding was done.

## Sealed Concrete

Sealed concrete offers all the benefits of bare concrete plus improved cleanability<sup>6</sup>. It is low maintenance, very durable, seamless, provides texture for a non-slip surface, and provides a continuous smooth surface for easy cleanability. This approach resists staining or adsorption of oils, salts, and water.

## Options for Sealing Concrete

There are many options for coating and sealing concrete including different types of paint, epoxy or rubberized coatings<sup>5</sup>. Many of these can be found at your local building supply or hardware store and can be installed yourself. Floor preparation is important to achieve a durable seal. This includes cleaning (washing), etching (or sanding), and finally application of the sealant by either spraying or rolling. There are contractors out there that specialize in this as well if you want to outsource this task.



▲ Close-up view of a concrete floor with an epoxy finish

## ACKNOWLEDGMENTS

Funding for this statement, publication, press release, etc. was made possible, in part, by the Food and Drug Administration through grant PAR-16-137 and by the USDA's National Institute of Food and Agriculture through the Specialty Crops Research Initiative under award number 2016-51181-25402 and Food Safety Outreach Program award 2016-70020-25792 accession 1010528. The views expressed in the written materials or publications and by speakers and moderators do not necessarily reflect the official policies of the U.S. Department of Health and Human Services or the U.S. Department of Agriculture; nor does any mention of trade names, commercial practices, or organization imply endorsement by the United States Government.

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CULTIVATING HEALTHY COMMUNITIES

June 2018—v1.1

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