

The following failure criteria will guide our repair or replacement of concrete panels. Repairs, if required will be performed on individual failed panels or portion thereof. Concrete panels are defined as sections enclosed by control joints. The damages considered are cracking, scaling or spalling, popout or vertical displacement at joints or cracks.

FAILURE CRITERIA

Cracking

A crack greater than ¼-inch in width over the total thickness of the panel and longer than 30% of the total panel perimeter or that completely bisects the panel will be considered for repair. For example the crack length of a nominal 10 ft x 10 ft panel would need to exceed 12 ft and be greater than ¼-inch in width at some point along the crack.

Scaling or Spalling

Scaling or spalling is any major surface degradation of the panel that covers 25% of the panel's surface. Panels with damage exceeding this criteria will be considered for repair.

Popout

Popout are typically cause by freeze thaw action and are circular and conical in nature. Panels that exhibit more than 50 popouts per 100 square ft will be considered for repair.

Vertical Displacement

If vertical displacement between concrete panels or panel sections at cracks is in the range of 3/4-inch to 1 1/2-inch in height repair will be considered depending on location and trip potential. At 1 1/2-inch height difference repair action will be taken at the first opportunity.

Color differences between original, or repaired and original panels is not considered failure. Color variation will exist between panels and possibly within the panel

Prior to repair or replacement of concrete panels all underlying failure mechanisms should be identified if possible and mitigations designed into the repair. Most concrete failure is caused by exposure to water under freeze thaw conditions. The obvious solution is to eliminate the water if possible. Items to consider are:

1. Gutter and downspout repair or placement. Do the gutters leak or do the down spout direct water to the surface of the concrete? Can the water be diverted or gutters repaired?
2. Work with residence to eliminate chipping ice. Some solutions are: Heavy protective mats, Sanding the area, or as a last solution using Safe deicer. Work with WD on deicer uses. Calcium Chloride salt has minimal damage effect on concrete and asphalt after the first year from installation. Some plant damage may occur so planting could be adjusted to reduce exposure and this salt is considers relatively harmless to pets assuming occasional exposure. Deicers should only be used where primary access paths are involved and safety is a concern.
3. Concrete can also be protected with clear or colored sealers. Sealer maintenance should be considered for north facing panels or panels exposed to repeated wetting from freeze thaw condition.