

Control Joints in Portland Cement Plaster

Control joints are used in portland cement plaster (stucco) to alleviate the stresses that can cause a brittle cement plaster membrane to crack. The installation of control joints are recommended by the NWCB and required by ASTM C 1063. However, there are no building code requirements to install control joints in a stucco system. The NWCB is often asked to assist in the placement of control joints on stucco projects. The NWCB has some standard recommendations and try to stay to these recommendations as much as possible (refer to the *NWCB Stucco Resource Guide*).

It is important to determine the type of building and expectations of the owners/designers when deciding how many control joints to install. For example, many owners feel a French country or English style homes might not look right with control joints and minor hairline cracks would be acceptable and expected for these style buildings.

The NWCB strongly recommends the use of control joints with multi-level wood framed buildings. In single-family homes, the NWCB is much more relaxed on the recommendations for control joints. We have seen homes from California to Canada with “no” control joints perform very well. It should also be noted that using control joints is not a guarantee against hairline cracks.

Typical locations to consider locating control joints are:

- Corners of doors and windows
- To break up long or large expansive panels
- Floor lines
- To break up “L” shape panels

Designers should be the party responsible to decide where and if control joints are desired. A designer and or engineer may also have ideas as to where stresses may concentrate and make specific recommendations.

Panel Size

The NWCB recommends breaking up large panels of cement plaster in the range of 150 to 180 square feet. ASTM calls for 144 sq. ft (12 feet x 12 feet), the exact number of 144 square feet and strict adherence to this equation does not insure against cracking. The NWCB has seen panels larger in size with no cracking, typically they employed the use of fiber shorts to reinforce the stucco mix. The NWCB believes these fibers can allow slightly larger panel sizes than the previously published ASTM standards.

Long narrow panels should be given consideration and may be unavoidable. The large panel rule is an attempt to keep panels as square as possible or to a 3 to1 ratio. In today’s more elaborate designs, buildings are typically more articulated then in years past and some leeway should be given. For example, cutting up an 18 inch high by parapet that runs the length of the building into 3 foot sections might be considered more unattractive than a “possible” hairline crack.

Designers, contractors and owners should communicate desires and concerns when deciding where and if to install control joints. If no control joints are desired, there are steps the contractors can take to help “minimize” potential cracking (refer to NWCB Technical Document PCP-628 Limiting Cracks in Stucco).

One idea that may assist designers/contractors in minimizing the negative impact of cracks in stucco, is to have the areas most visible and typically the most concern for building owners is to have the “entry area” receive a trowel applied mesh over the brown coat prior to applying finish coat.

For more information and definitions between control and expansion joints, refer to the NWCB Technical Document 600-605 “*Stress Control for Portland Cement Plaster Systems*”.

This technical document is to serve as a guideline and it is not intended for any specific construction projects. NWCB makes no express or implied warranty or guarantee of the techniques, construction methods or materials identified herein.