



Manufactured Building

Wayne Goodwin | Commissioner of Insurance
Tim Bradley | Assistant State Fire Marshal

MEMORANDUM

DATE: August 15, 2012 (updates November 17, 2010 memo)

TO: Third Party Inspection Agencies, Building Officials, Modular Manufacturers, Modular Set-Up Contractors, and Other Interested Parties

FROM: Alan D. Greene, P.E.
Chief Building Code Consultant
Manufactured Building Division

RE: Surface Bonding Cement / Building Support Piers

This memorandum is to confirm that it is acceptable to the Department of Insurance to use a surface bonding cement to bond masonry piers together in lieu of the normal method of laying the masonry units in mortared joints. The Department's original approval of this method was based on interpretation of Section 1402.16 in the old Volume I, *General Construction Code* (1978 Edition). The only reference to surface bonding in the *North Carolina Building Code, 2012 Edition*, is **Section 2103.9**, which refers to **ASTM Standards C 887 and C 946** for surface bonding mortar and for surface bonding of concrete masonry units, and **Section 2109.2.3**, dealing with surface bonded walls. However, even though the old reference (1402.16) has no equivalent in the current Code, the Department of Insurance still finds this method of bonding masonry piers to be an equivalent and acceptable alternate to bonding masonry piers with mortar joints. Based on **Section 105, Alternate Material, Design or Methods**, of the *North Carolina State Building Code: Administrative Code and Policies, 2012 Edition*, the Department of Insurance accepts the method of bonding masonry piers with surface bonding cement in lieu of bonding with mortared joints on both one and two family residential dwellings and on commercial structures, so long as the referenced **ASTM Standards** in **Section 2103.9** of the *North Carolina Building Code, 2012 Edition* are adhered to.

Note that the use of surface bonding cement is NOT permitted for piers in pier and curtain wall construction. (See attached memo of April 26, 2012).

attachment



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MEMORANDUM

DATE: April 26, 2012 (Updates July 10, 2009 memo)

TO: Approved Third Party Certification Agencies

FROM: Alan D. Greene, P.E. -- Chief Building Code Consultant, Manufactured Building Division

RE: Pier and Curtain Wall Construction with On-Frame Modulares

As you are aware, brick skirting walls for modular homes must be pier and curtain wall construction in accordance with **Section R404.1.5.3 of the NC Residential Code, 2012 Edition**. For such construction it is required that each pier be bonded to the brick curtain wall, typically with 3/16" diameter metal wall ties embedded in the horizontal mortar joints, or with masonry headers. *Note that corrugated wall ties are not acceptable for this application.* For a 4" brick masonry curtain wall, the maximum pier spacing is 6 ft. (see **Table R606.9**).

We have been made aware of a situation that occurs with on-frame modulares. It is permissible for required perimeter support piers specified by the home manufacturer to be used as part of the pier and curtain wall system *so long as they are bonded to the brick curtain wall as described above*. Common practice is that almost all contractors typically set the first course of load bearing piers in a mortar bed on the footing, dry stack the piers, and then apply surface bonding cement ("surewall"). *The problem is that it is impractical to bond piers to the curtain wall if the piers do not have horizontal mortar joints.* We recommend implementing one of the following solutions:

- 1) Load bearing perimeter piers (usually at the end walls) that are to be part of the pier and curtain wall system *shall be constructed with mortar joints, not surface bonding cement*, with the wall ties installed for later use by the brick mason.
- 2) The manufacturer should locate load bearing perimeter piers a small distance back from the perimeter curtain wall. Locating the piers back from the edge of the perimeter will allow these piers to be dry stacked and surewalled, since they are no longer part of the pier and curtain wall system. The mason can then construct the pier and curtain wall in its entirety, setting the piers (usually 4" x 8" x 16" concrete masonry block) in mortar and bonding to the curtain wall in accordance with **NC Residential Code** requirements. These piers are strictly for curtain wall support, and do not support the main I-beams. This arrangement (moving back the load bearing perimeter piers) must be indicated on the plans and approved by the manufacturer's engineering department.

Third Party Agencies are responsible for addressing this situation on all future applicable plans. Sufficient notes must be included on the foundation drawing to make the requirements clear to both contractors and local officials. Please be aware of the 6 ft. maximum spacing as described above. As an alternative, an engineered design sealed by a NC professional engineer will be acceptable.

cc: Joseph H. Sadler, Jr., P.E. -- Deputy Director
C. Patrick Walker, P.E. -- Technical Services Manager
Michael J. Hamm, P.E. -- Building Code Consultant
P. Shane Phelps -- Building Code Consultant