SPANCRETE MANUFACTURERS ASSOCIATION

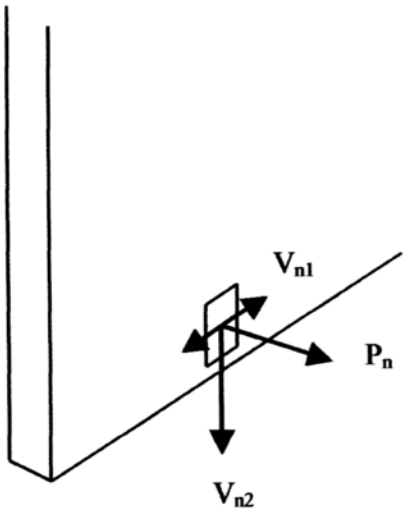
RESEARCH NOTES

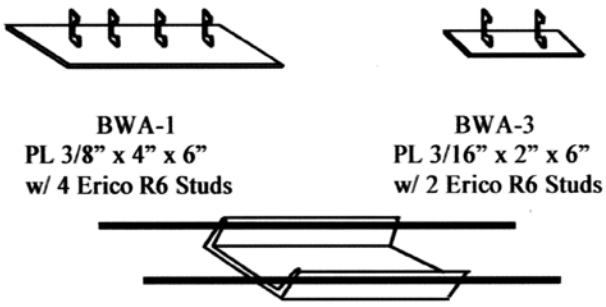
BASE CONNECTION DESIGN FOR SPANCRETE HOLLOWCORE WALL PANELS

Spancrete hollowcore wall panels used in a vertical orientation require connections to the foundation. These connections may be subjected to normal forces due to wind load and eccentric axial load, or uplift and in-plane forces if acting as a shear wall. Where applicable, the base connections may also have to satisfy the structural integrity provisions of AC1 318.

Spancrete wall panels are typically welded to a continuous or spaced clip angle that has been welded or properly bolted to the foundation. The SMA has tested a number of weld anchor assemblies for use as the panel weld anchor in such a base detail. Three are shown below, with their test capacities.

Insert	V_{n1}	V_{n2}	P_n
BWA-1	15.17k	5.62k	3.30k
BWA-3	9.31k	4.66k	2.52k
BWA-6	31.04k	13.0k	5.34k





BWA-1
PL 3/8" x 4" x 6"
w/ 4 Erico R6 Studs

BWA-3
PL 3/16" x 2" x 6"
w/ 2 Erico R6 Studs

BWA-6
C4 x 5.4 x 0'-6"
w/ 2 - #3 Bars

It is recommended that a strength reduction factor of 0.70 and an additional connection load factor of 1.3 be used with these test values.

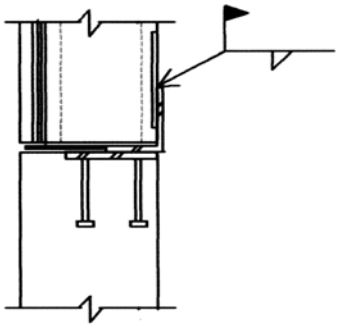
A design example is given on the reverse side.

Research Notes are produced periodically by the SMA Technical Committee. SMA Research Notes are based on testing done for the Spancrete Manufacturers Association. The information contained in these Research Notes should be used by those experienced in structural design and should not replace sound engineering judgment.

SPANCRETE MANUFACTURERS ASSOCIATION

DESIGN EXAMPLE

BASE CONNECTION DESIGN FOR SPANCRETE HOLLOWCORE WALL PANELS



GIVEN:

Wind normal to panel = .9 k per connection
Uplift due to in-plane wind = 4.2 k per connection
Shear due to in-plane wind = 1.31 k per connection

PROBLEM:

Select a panel anchor for the base detail shown
to resist the loads given.

SOLUTION:

For in-plane wind uplift, the factored force is $V_u = 1.6(4.2) = 6.72$ k
Applying the PCI recommended connection factor, $V_u = 1.3(6.72) = 8.74$ k
From the table on the other side, select a BWA-6, $\varnothing V_{n2} = 0.7(13) = 9.1$ k
Check in-plane shear capacity for BWA-6: $V_u = 1.6(1.31) = 2.10$ k
Applying the recommended connection factor

$V_u = 1.3(2.10) = 2.73$ k [$< \varnothing V_n = 0.7(31.04) = 21.73$ k OK]
Check normal wind on BWA-6: $P_u = 1.6(.9) = 1.44$ k
With the connection factor:
$P_u = 1.3(1.44) = 1.87$ k [$< \varnothing P_n = 0.7(5.34) = 3.74$ k OK]

Conclusion:

Use BWA-6 for the panel weld anchor.
(Note that the BWA-6 anchor has sufficient capacity for the ACI 10 kip structural integrity connection, if required.)

Note: Sample calculations are intended to illustrate the concept presented and do not represent all considerations necessary for the complete design.