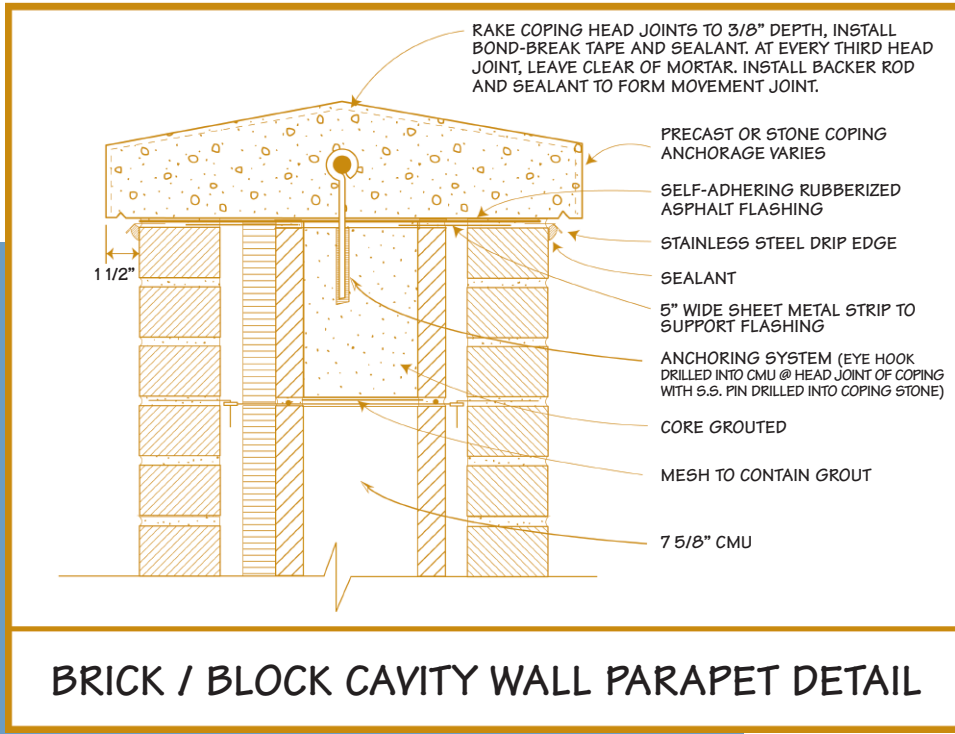


masonry detailing WITH LIMESTONE, PRECAST CONCRETE

or CAST STONE COPINGS & SILLS

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BRICK / BLOCK CAVITY WALL PARAPET DETAIL

With greater use of limestone, precast concrete and cast stone elements within a masonry elevation for added detail, aesthetics or preference, there is more likelihood of problems cropping up. CRACKED or separating mortared head joints and possible water penetration, often resulting in efflorescence or wetness at these locations, are the most common. In general, mortar bonds better to limestone head joints than cast stone elements because of the porosity of the limestone. Precast concrete and cast stone may have potential bonding problems to the mortar if:

- 1 The precast or cast stone is cut with a concrete saw. When the joint is highly polished, as it is when cut with a concrete saw, the smooth polished edge is difficult to bond with mortar.
- 2 A manufacturer may add stripping/de-bonding agents to the molds to facilitate stripping and reuse of the molds. This chemical/smooth finish edge does not aid in the mortar bonding to the head joint of the precast concrete or cast element.

All precast concrete, cast stone and limestone parapet caps and sills should project beyond the face of the brick/masonry wall by 1 1/2".

They should also have a drip cut into the projected edge or a drip formed or cut in the precast elements. All parapet caps should be flashed continuously under the cap with a small preformed stainless steel (or copper) drip edge on both sides of the cap. Ideally, the cap should be double pitched or pitched to the inside of the parapet. The cap details should include height, depth, length, pitch and the drips and should be detailed on the architectural/shop drawings. Below are sample details.

DETAILING THE PARAPET CAP HEAD JOINTS

Architects must detail parapet cap head joints on their drawings. Mortar joints of the exposed top horizontal joints and the exposed vertical head joints must be raked and caulked. If you don't show the detail – you may not like what you get!

FYI

Mortared joints in joints between dissimilar materials and between precast concrete and cast stone units are prone to cracking and separation. The Cast Stone Institute Design Tips – Technical Bulletin #42 on Mortars contains the following statement regarding joints:

"The decision on whether to use mortar/pointed joints or sealant joints is a common one. All head joints at coping and joints at column covers, cornices, platforms, soffits and in general, all stone sections with projecting profiles, exposed top joints or rigid suspension connections to the supporting structure should be "soft" sealant joints."

When mortar is used, the same document contains the following statements:

"Rake all stone-to-stone joints [when mortar is not set (green)] to a depth of 1/2" for pointing later."

"Selection of the correct grade of mortar is perhaps the most important factor in the performance of a masonry wall. The mortar must have sufficient strength, be durable, resist rain penetration as much as possible and yet be flexible enough to accommodate slight movement within the wall. Mortars used in the setting of cast stone should meet the requirements of ASTM C270, Type N."

The Architectural Precast Association cast stone specification for precast stone states that joints with exposed tops, joints under relieving angles and head joints in copings and similar units should be left open for sealant.

If Type S mortar is specified for the project, in general, it is stronger than the recommended Type N mortar for copings and sills. The use of stronger mortar increases the likelihood that cracking will occur. This is because of the higher cement content in Type S.

The Indiana Limestone Institute of America Inc, on page 66, of the 21st Edition of ILI Handbook, under limestone coping, states

“Sealant and backer rod, installed properly is preferable to mortar for front, top and back joints.”

The Masonry Advisory Council recommends the following for new construction and correction of existing construction:

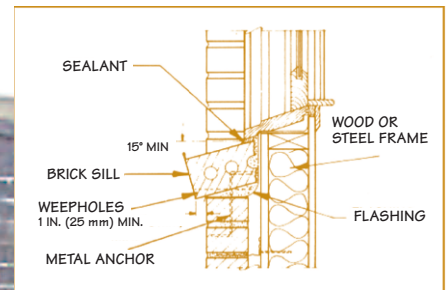
- 1 All joints between the precast concrete, cast stone and limestone units should be raked out to depth of 1/2” and have backer rod and sealant installed or rake the joint out to a depth of 3/8” and install sealant over a properly placed bond breaker tape to prevent three sided adhesion.
- 2 At the jamb line by the sills, install no mortar in this head joint – just a 3/8” void joint with 5/8” backer rod and architectural colored sealant.
- 3 With parapet copings and long continuous details – rake the mortar for a 3/8” depth at the top and vertical front and back joint, install a bond break tape and sealant – and at every third joint (for thermal expansion), put no mortar in this head joint, only a backer rod and sealant.
- 4 In order to prevent mason contractors from omitting any caulking and sealant installation in their proposals – make sure this caulking and sealant installation is shown on the drawings. This is for the caulking contractors doing the expansion/control joints, possible window sealing and cast stone, precast concrete, limestone sills or parapet caulking installations.

REGARDING METAL DRIP EDGES

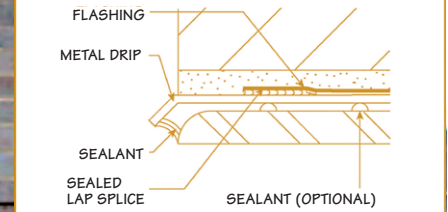
Flashing should be exposed with a drip edge, as shown in details. This is discussed and shown in BIA Technical Note 7 Revised April 2001, Figure 11. This flashing is also shown exposed in the AIA Architectural Graphic Standard, 9th Edition. If that is not enough to convince you to show the drip-edge exposed in your building, the forensic engineer hired by your



Note the efflorescence, and the flush limestone cap- it should have had 1 1/2” projection, with drip edge and flashing under the cap.



BIA Detail, Technical Note 7, Revised April 2001, Figure 11



BIA Detail, Technical Note 21B, Revised April 2002, Figure 1

E & O insurance carrier will also say that the drip edge should have been called out, shown and exposed on your drawing.

I have heard all the reasons why architects do not expose the flashing in a masonry wall. Among the best are:

“When the sun hits the wall at a certain time of the day and angle there is a slight reflective glare emitted from the drip edge.”

“The slightly projected copper or stainless steel drip edge detracts from the architectural presentation of the exterior wall.”

“I never use a drip edge in any of my award winning masonry designs and have never had any problems of efflorescence or water penetration.” (The architect’s primary practice is probably in Texas or Southern California).

Who are we building these buildings for? I have never heard an owner say, “That flashing sticking out of my masonry wall is ugly,” or “It detracts from the design I bought from the designer.” But I have had many owners say, “You mean if the flashing was sticking out that 1/2”, I wouldn’t have all these water problems or efflorescence?” **ME**