Detailing masonry parapets

Exposed on both sides, parapets are vulnerable to rain and temperature changes

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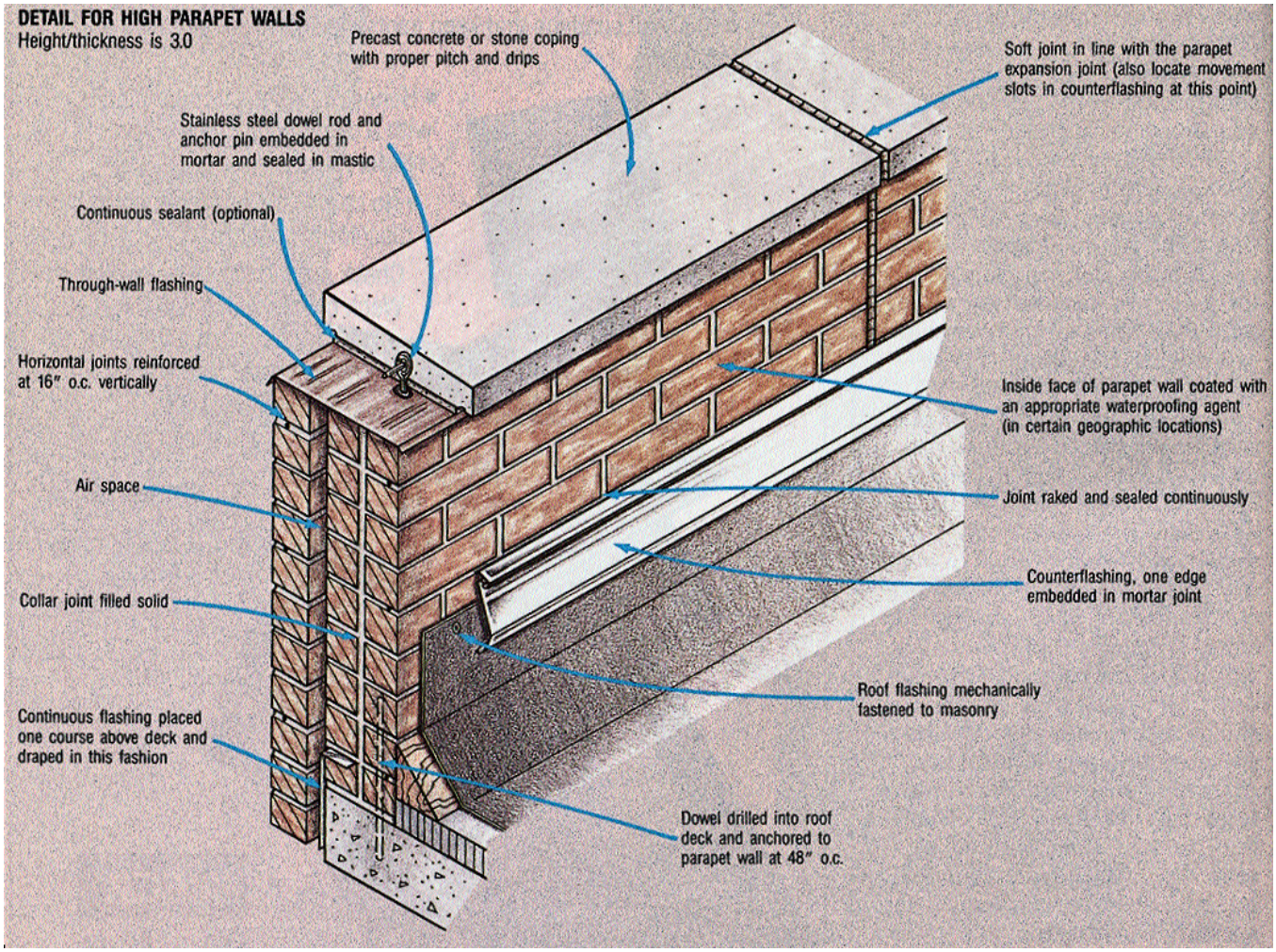
A parapet wall is the portion of a wall that extends above the roof. Its purpose might be aesthetic, hiding mechanical equipment and providing a distinct roof line. Or it can be functional, helping to prevent flames from spreading from rooftop to rooftop. Codes often require parapets for this reason.

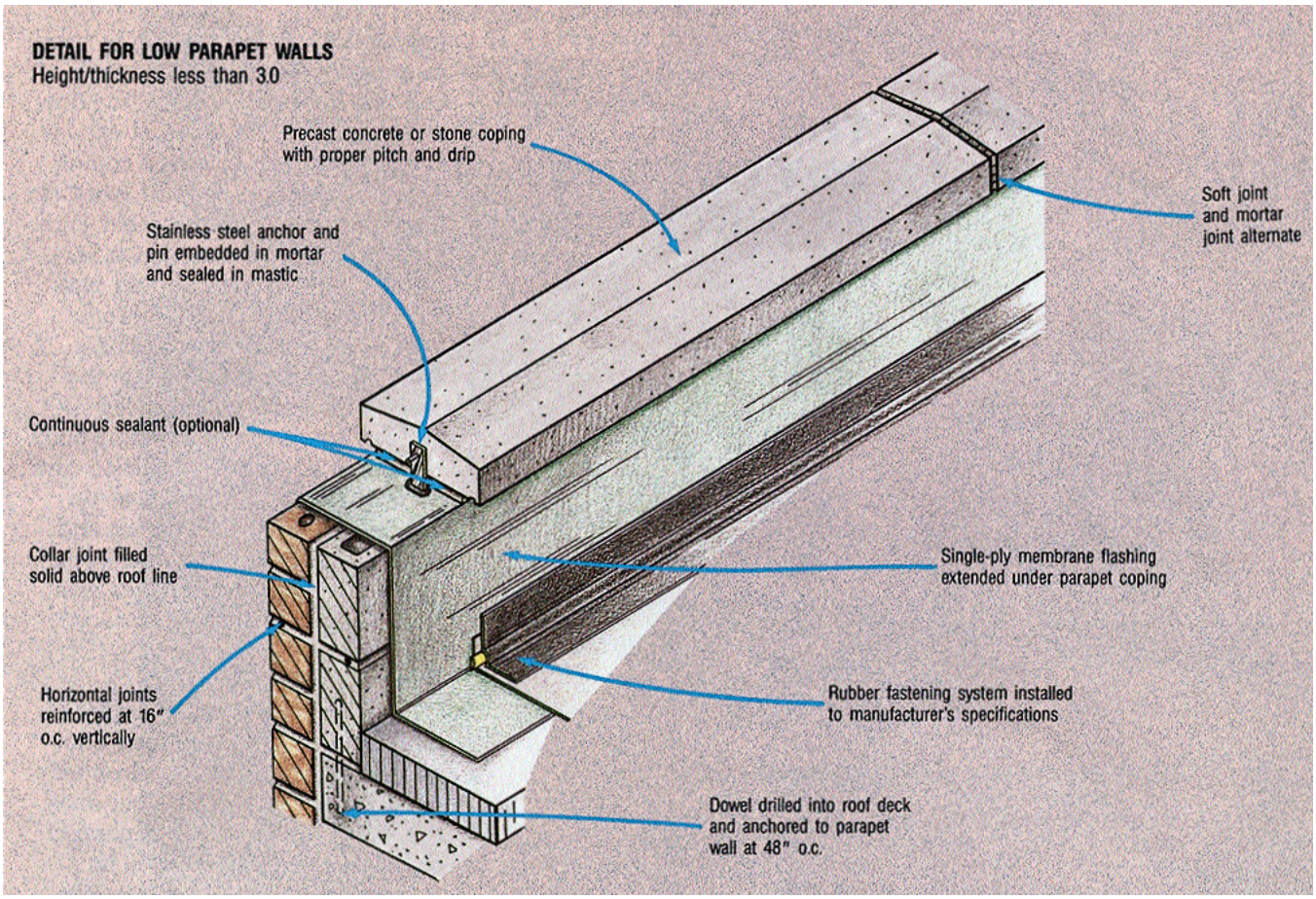
Because parapet walls have two exposed surfaces, they can suffer serious problems. Both sides of the wall are subjected to temperature swings and rain. In northern regions, snow drifts up against the walls, further increasing the possibility of moisture infiltration. These conditions are more severe than those that building walls in moderate climates are subjected to. As a result, parapet walls are more susceptible to displacement, cracking, efflorescence, and spalling. Avoiding these problems requires careful detailing and vigilant maintenance. Two good ways of detailing parapets are illustrated here.

Coping

The top of a parapet wall is the most vulnerable area. Developing an effective detail here helps eliminate or minimize most moisture-related problems. Choosing an appropriate cap is the first step in doing this.

Although a variety of copings are available to cap off the wall, a coping of similar material to the parapet is strongly recommended. This would include: limestone, precast concrete, hard-fired clay, or terra-cotta. These





materials have thermal properties similar to those of brick and concrete block. Metal caps, on the other hand, have a thermal expansion coefficient three to four times greater than brick. This causes a significant amount of differential movement between the parapet cap and parapet wall. Although slotted movement joints usually are provided, leakage in metal caps is common.

Another type of coping is a brick rowlock cap. Though brick rowlock is attractive, it should be used only in moderate climates. Rowlock copings contain many exposed mortar joints that can retain moisture. Avoid using it in areas where severe freeze-thaw cycles occur.

Copings can be cast and formed into a variety of shapes, but they must all possess adequate pitch, sufficient projections (at least 1 1/2 inches), and continuous drips. These elements protect the parapet from ponding snow and water and prevent the water from running down the outer wall surfaces.

Flashing

Most copings are susceptible to moisture penetration where the individual sections butt (at head joints). To prevent moisture from entering the wall from the top, install a continuous through-wall flashing membrane within the mortar bed immediately beneath the coping. This flashing membrane can be made from stainless steel, copper, asphaltic glass fiber, vinyl, plastic, or a combination of these materials. Placed completely through the wall, it creates a slippage plane between the coping and the parapet. To prevent the coping from sliding or blowing off, it must be anchored to the wall below. A variety of stainless steel anchoring systems can be used. Use a generous amount of mastic wherever the anchorage penetrates the flashing.

Through-wall flashing protects the parapet from moisture permeance at the top of the wall, but the inner exposed side of the parapet remains vulnerable, especially in areas where snowfall is common. To protect the inner wall surface, tuck the roof flashing under counterflashing or coat the wall with a waterproofing agent.

Joints

If certain conditions are overlooked, displacement of parapet walls, particularly at the coping, is common. As a result, parapet walls can crack, heave, or bow. To allow movement due to thermal expansion, at one end of every coping section install a soft joint (void of any mortar) and at the other end place a mortar joint. Also, a vertical expansion joint should pass completely through the parapet wall at 30-foot intervals. These joints should coincide with any other expansion joints in the roof and walls below. Constructing both wythes of a parapet with the same material (brick and brick or under certain conditions brick and block) enables the separate wythes to react to weather changes as a single unit.

Height limitations

Keep the height of a parapet to a

minimum. The American Standard Building Code Requirements for Masonry (see reference) does not allow the height of a parapet wall to exceed three times its nominal thickness. If the height exceeds this limit, then more lateral support is needed. Vertical rebars and grout placed within the wall at appropriate intervals can provide lateral support. Piers and pilasters also can be used. A parapet wall of the proper height and width, however, might still lack the weight necessary to maintain its integrity. Anchoring the wall to the roof structure with vertical reinforcing dowels (where applicable) should solve this problem.

Reference

American Standard Building Code Requirements for Masonry, ANSI A41.1-1953, American National Standards Institute, 1430 Broadway, New York, New York 10018.

Editor's note

This article illustrates two good details for masonry parapet walls. But they're not the only proper details. If you detail or build masonry parapet walls differently, share your design with us and our readers. Send us a drawing of your parapet detail. Be sure to point out its main attributes. Mail to Parapet Editor, The Magazine of Masonry Construction, 426 South Westgate, Addison, Illinois 60101.

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