

PROCEEDINGS

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STUCCOMETRICS: ASTM C1861: NEW PARADIGMS FOR STUCCO LATHING ACCESSORIES

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ABSTRACT

Stucco lathing accessories exist and are required by building codes to improve portland cement. Insights are presented regarding the development and technical content of the new and profusely illustrated stucco industry standard, ASTM C1861, Standard Specification for Lathing and Furring Accessories and Fasteners for Interior and Exterior Portland Cement-Based Plaster, by the presenter, the primary author of the standard. The standard defines 30 fundamental and generic lathing and furring accessories and fasteners, and defines 11 new lathing accessory-related terms. Recommendations are given to assist designers, manufacturers, craftspeople, and building owners in understanding the function, specification, and use of generic stucco lathing accessories, which are individually presented and discussed in detail, including their intrinsic characteristics, attributes, functions, and limitations.

SPEAKER

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JEFF BOWLSBY is an architect and stucco consultant with Simpson Gumpertz & Heger. His nationwide practice includes new building construction and rehabilitation projects, as well as performing property condition assessments and forensic evaluations. He leads the ASTM C1063, Installation of Lathing and Furring for Portland Cement-Based Plaster task group and founded and leads the ASTM C11 Stucco Work Group that develops all ASTM stucco-related industry standards referenced in building codes and construction contracts. He has completed performance testing of stucco assemblies and components, published in industry magazines, is the author of the stucco information resource StuccoMetrics.com, and is a frequent presenter on stucco wall claddings.

STUCCOMETRICS: ASTM C1861: NEW PARADIGMS FOR STUCCO LATHING ACCESSORIES

HISTORY OF LATHING ACCESSORIES

Stucco industry standards were initially developed by the plastering trades as a way of documenting and training craftsmen in best practices. Later, the standards were used as a means of promoting uniform portland cement-based plastering practices to architects, general contractors, and building owners. ASTM stucco standards were voluntary and regularly specified by architects in contract documents as project-specific contractual requirements and for quality control purposes. It was not until the 2000 International Building Code (IBC)¹ was adopted that the standards became minimum building code requirements.

This paper may at first glance appear to use the terms “portland cement-based plaster” or “cement plaster” and “stucco” interchangeably, but they are intentionally different terms with related but subtly discrete meanings. In general, “cement plaster” is the term used for portland cement-based plaster while in its fluid or plastic state, whereas “stucco” is cement plaster after it has cured into its hardened state.

The U.S. government saw the potential economic benefits of stucco claddings for building owners and the construction industry and wanted to encourage its use in

the American market. As a result, it sponsored several rounds of extensive and large-scale testing of stucco claddings through the Department of Commerce in the 1910s, which primarily focused on determining the causes of cracking and how to eliminate cracking. Since the earliest use of stucco on wood-framed buildings, cracking has been of concern and has been especially evident at reentrant window corners—the most predominant stucco crack pattern, both then and to this day.

J.J. Earley, an artist and craftsman, was an early and prominent stucco cladding proponent. Resulting from his observations of the Department of Commerce testing and participation on an American Concrete Institute (ACI) committee related to cement plastering, he soon developed his own attempted solution to the window corner cracking problem. He posited that common wood windows, when surrounded by stucco, swelled due to water exposure and pressed against the curing cement plaster, causing the reentrant corner cracks. To relieve the stress on the curing stucco, he developed a spring-like isolation device that would wrap around windows between the window and the cement plaster and, in theory, cushion the expanding window frame from the curing cement plaster to prevent

reentrant corner cracking. His invention is embodied in his *Patent 1355756, Flexible Joint for Stuccoed Buildings*,² from 1920 (Figure 1). Nice try, J.J., but you overlooked an important factor that has become better understood since your time. The wood window frame may be expanding, but more significantly, the cement plaster shrinks during curing, which is a main contributor to the reentrant corner cracking condition.

The first stucco standard for use on building exteriors was published in 1920 by ACI, entitled *Standard No. 25, Standard Recommended Practice for Portland Cement Stucco*.⁵ J.J. Earley had served on the committee that developed the standard. Interestingly, this standard recommended good drainage provisions for stucco, including sheet metal drainage flashings above windows and doors, at stucco walls above roofs, and at the base of exterior stucco walls where stucco was recommended to terminate above grade. However, *Standard No. 25* did not discuss the use of any specific lathing accessories other than the corner bead. Realize that the use of stucco as an exterior wall cladding material on framed substrates was in its infancy in 1920, and the plastering trade was mostly focused on gypsum and lime-based plasters used at building interiors. In that context,

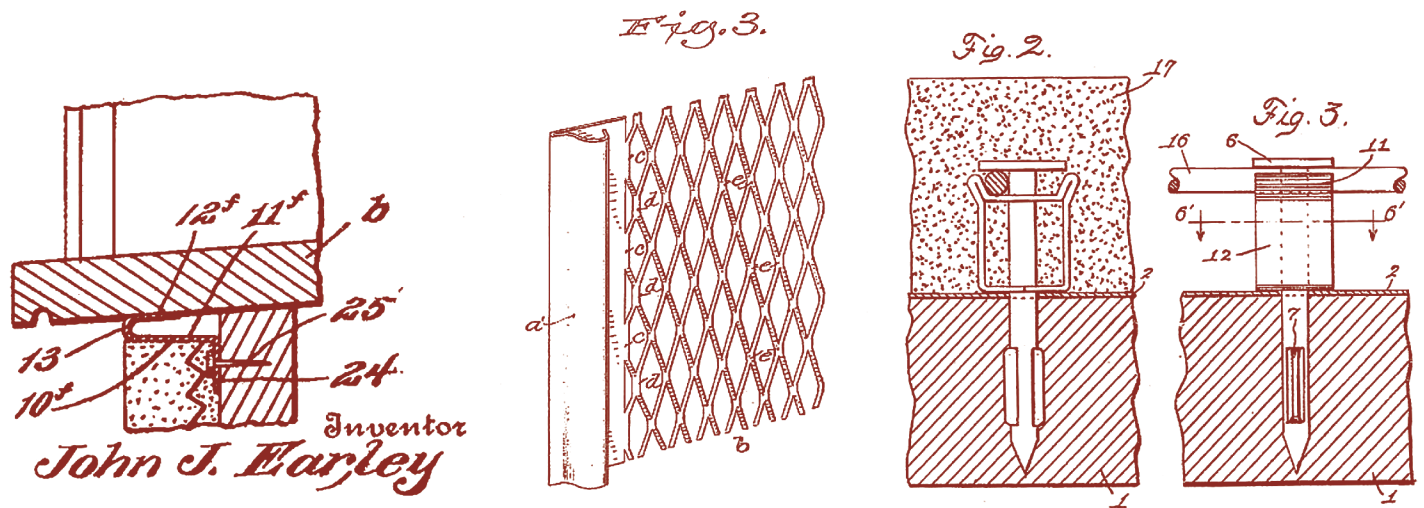


Figure 1 – Examples of early stucco-related lathing accessories and a lath fastener. *Flexible Joint for Stuccoed Buildings*, Patent 1355756, J.J. Earley, 1920 (left); *Plaster Terminal*, Patent 1419232, L.E. Curtis, 1922³ (center); and *Wire Fastener*, Patent 1587879, G.F. Voight, 1925⁴ (right).



Figure 2 – Corner bead lathing accessory—hollow because it was incorrectly plastered.

plasterers introduced the expanded sheet metal corner bead to building exteriors. By 1920, the stucco industry had enough experience with corner beads used on the exterior to find them unsatisfactory for exterior use because they corroded and resulted in hollow corners, which created a weak condition in stucco claddings. *Standard No. 25* specifically recommended that corner beads not be used for building exteriors; but for external corners, the lathing was to be folded around the corners and stapled down within 3 in. of the corner for reinforcement.

In 1923, the first furring nail for lathing was invented by Sawyer Monkton, as described in *Patent 1473497, Wire Fastener*.⁶ Shortly afterwards, the first model building code in the west, the 1927 Uniform Building Code (UBC),⁷ required a furring device to “positively fur the metal [lath]” above the substrate. Over the decades of the 20th century, many creative people were developing lathing accessories; it was a proverbial gold rush for inventing and bringing stucco lathing accessories to market to serve specific needs in the stucco industry. Over 100 patents were filed for lathing accessories, in addition to lathing, plastering, and other stucco-related devices during this period.

Corner beads have had a tumultuous relationship with stucco in the building

code, especially in the early years of the development of stucco as an exterior building cladding. The 1935 UBC⁸ first recognized the use of external corner beads; then the 1958 UBC⁹ specifically prohibited the use of corner beads. Then the 1961 UBC¹⁰ allowed corner beads where protected from corrosion and installed to ensure a mechanical bond and solid plaster corners. The performance problems associated with corner beads that contributed to the turmoil originated from the adaptation of interior corner beads to exterior uses. The original sheet metal lathing corner bead accessory was designed for a fine-grained interior plaster where it was not subject to moisture. When installed at exterior building locations, plasterers had difficulty applying the plaster through the small expanded sheet metal flange apertures of the corner bead, especially where fibers were added to the cement plaster mix, resulting in hollow corners that were not durable and where the corner bead had a propensity to corrode. Corner beads today are manufactured with larger apertures to accept the wet cement plaster and are corrosion resistant. Additionally, applicators are better trained to avoid creating hollow corners (*Figure 2*).

With the culmination of World War II, an unparalleled construction boom prolifer-

ated in America. New construction methods were introduced to expedite construction and reduce costs, such as slab-on-grade concrete floor slabs replacing raised wood flooring in production housing. In 1946, this environment spurred the development of the next significant voluntary stucco standard, *A42.2 and A42.3, Standard Specifications for Portland Cement Stucco and Portland Cement Plastering, Including Requirements for Lathing and Furring*,¹¹ which was sponsored by the American Standards Association. On the one hand, it stated that “permanent grounds, screeds, or corner beads shall not be used for portland cement stucco”; yet wood grounds installed by carpenters and metal grounds installed by plasterers were mentioned. It further specified that “metal accessories such as corner beads and base screeds shall be 26-ga.

galvanized steel, with expanded flanges or clips to permit complete embedment in the plaster.” While ANSI A42.2 and A42.3 were voluntary standards, the 1955 UBC¹² required cement plaster “grounds to provide for the thickness of plaster.” Grounds were typically provided by wood stripping temporarily or permanently installed, or by metallic casing beads, which had been available as early as the 1920s. No other lathing accessories were described in the 1955 UBC.

Torrential rains in southern California during the winter of 1951-52 caused water leakage at the base of stucco walls where the stucco cladding had been applied to extend from the wood wall framing and adhered onto concrete floor slab foundation wall edges down into the soil. The industry had apparently forgotten the 1920 *Standard No. 25*, which did not allow stucco to extend into the soil. As a result of the southern California storms, the foundation weep screed flashing component was developed in 1953 as one of the earliest water-management devices that is still ubiquitous today. It became known as the “FHA screed” or the “No. 7 weep screed,” and became an FHA requirement for federally funded construction where stucco cladding was used (*Figure 3*). No patent is known to exist for

this combination weep screed flashing and lathing accessory, but it did get publicity in plastering trade journals. The foundation weep screed located at the base of stucco wall claddings became a building code requirement with the 1967 UBC.¹³

Cracking continued to be a concern for stucco. The standards and jobsite practices relied on mix design, moist curing, fiber additives, and workmanship techniques to minimize cracking, which were commonplace. Manifold attempts to develop techniques and joints that would effectively minimize cracking were explored, but few had any market success until 1955, when the first commercially successful one-piece “control joint” lathing accessory was introduced to the market by Raymond Clark and the Penn Metal Co. This control joint lathing accessory provided a functional solution with a flexible pleat element that reduced cracking by reducing the induced stresses during curing caused by portland cement shrinkage and thermal movements. The control joint lathing accessory also has additional functions as a ground to control cement plaster thickness, and as a temporary work stoppage location (a termination).

Clark’s invention is described in *Patent 3015194, Building Construction and Expansion Joint Therefor*.¹⁵ Recently completed large-scale testing of control joints, correctly installed with discontinuous lath as required by *ASTM C1063, Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster*,¹⁶ is evidence of the control joint’s effectiveness for reducing cracking, but it is essential to realize that all stucco cracks cannot be eliminated by using control joints in stucco claddings alone.

Shortly after Clark’s control joint invention made it to market, another lathing accessory joint was developed by Ross Washam that was intended to accommodate even greater movement than the Clark control joint for reducing cracking. Washam’s joint is a two-piece lathing accessory with solid attachment flanges, which is today known as an “expansion joint” lathing accessory intended to accommodate building structural substrate movements to reduce cracking. Like the control joint, Washam’s invention also functions as a ground for controlling cement plaster thickness and a temporary work stoppage location (a termination); and coincidentally (or

not), the *Washam Patent 3331176, Building Construction and Expansion Joint Therefor*¹⁷ also bears the identical title as Clark’s. It is essential to understand that a “control joint lathing accessory” is not a “control joint,” which is a functioning assembly that includes the substrate and framing conditions, lathing condition (continuous or discontinuous), fasteners, and, of course, the cement plaster. The same can be said of the “expansion joint lathing accessory” and “expansion joint.” The intermingling of these terms has led to much confusion and dissension in the industry, which is presented in detail on www.StuccoMetrics.com. The current ASTM C1063 has resolved this dichotomy, but more on that later.

The control joint lathing accessory that required installation with discontinuous lath first appeared in the companion 1971 ANSI Standards A42.2, *Portland Cement and Portland Cement-Lime Plastering, Exterior (Stucco) and Interior*, and ANSI A42.3, *Lathing and Furring for Portland Cement and Portland Cement-Lime Plastering, Exterior (Stucco) and Interior*.¹⁸ The 1971 ANSI A42.2 and A42.3 standards were voluntary stucco standards and not codified requirements.

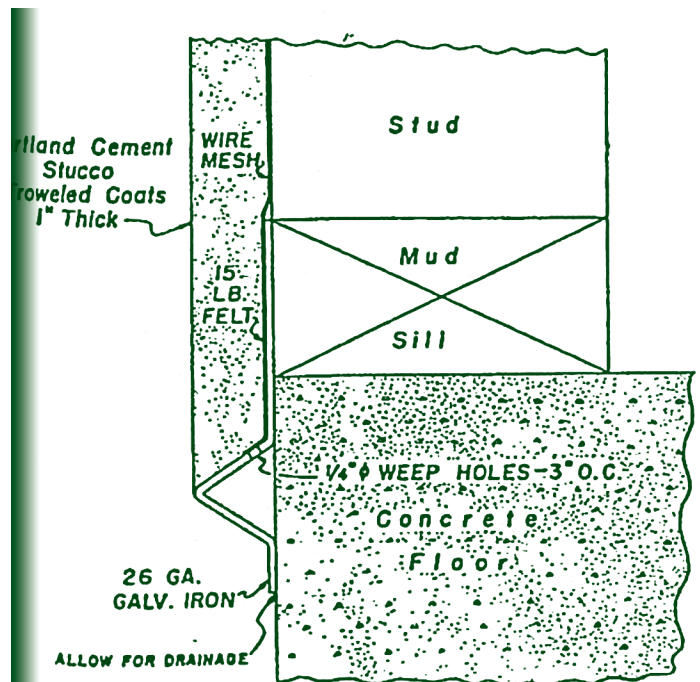
Stucco industry standards moved from the ANSI standards organization to the ASTM standards organization in the early 1980s and remained as voluntary standards until the 2000 International Building Code (IBC) codified them as reference standards and minimum building code requirements in any jurisdiction that adopted the IBC.

ASTM C1063 is the lathing installation standard first issued by ASTM in 1986, which largely ported over ANSI A42.3 from 1971 but included a few developments. ASTM

C1063 was the voluntary lathing installation standard used by the stucco industry since 1986 and was often referenced by architects as a contractual requirement for quality control.

INSIGHTS ON THE DEVELOPMENT AND TECHNICAL CONTENT OF C1861

In concerted efforts to better serve the industry, the ASTM C11 Stucco Work Group for several years now has been making tremendous progress at refining C1063 into a standard that is easier to use, better organized, has coordinated terminology, and has more clearly stated requirements. Nonetheless, C1063 has been somewhat cumbersome and complicated, resulting from decades of development by several different entities, and the intent has always been for it to be a lathing installation standard only. C1063 internally references other ASTM product standards such as C847 for metal lath¹⁹ and C954 for steel drill screws,²⁰ which is the standard organizational structure for ASTM installation standards. However, for the lathing



WATER STOPPER—Designed to release any water trapped between paper and exterior plaster at foundation line, metal water table or screed recommended by F.H.A. Los Angeles office shown with installation method.

Figure 3 – Original weep screed.¹⁴

TABLE 3 Lath and Lathing Accessory Fasteners

Fastener Type		Vertical Framing Members			Horizontal Framing Members		
		Wood Studs or Furring	Solid Bases	Metal Studs or Furring	Wood Joists	Concrete Joists	Metal Joists
		Fastener Length, minimum ^A					
Nails (Specification F1667)	Roofing nail, 0.120 in. shank diameter, and 7/16-in. (0.438 in., 11 mm) head diameter, minimum	1 in. (25 mm)			1-1/2 in. (38 mm) typical, or 2 in. (50 mm) for 3/8 in. Rib Lath		

Figure 4 – ASTM C1861, Table 3, Lath and Lathing Accessory Fasteners (excerpt).

accessories, furring accessories, and certain fasteners, no product standards existed to reference. Until 2016, C1063 referenced the basic material standards from which to fabricate lathing accessories, such as A653 for galvanized steel sheet,²¹ B69 for rolled zinc sheet,²² and D1784 for PVC.²³ Some of the product specifications, such as for nails, staples, and power-actuated fasteners, were incorrect or incomplete. Clearly, these material references were not helpful to lathers installing lath on a jobsite or architects and building owners who specified these products. Internally, specifying the range of products and materials within the text of C1063 was cumbersome and inefficient for an installation standard.

Recognizing these issues, I proposed

to ASTM Committee C11 to work within the Stucco Work Group to develop a new separate standard to contain the specifications for lathing accessories, furring accessories, and fasteners for stucco claddings. The new standard came to life as C1861-17, *Standard Specification for Lathing and Furring Accessories and Fasteners for Interior and Exterior Portland Cement-Based Plaster*,²⁴ first issued in 2017. Updated versions of C1861 have been and will continue to be developed and published as we continue to refine this new standard.

C1861 now contains the specifications for lathing accessories, furring accessories, and fasteners—essentially relocated from C1063 and updated—and now C1063 simply references C1861 for the required

specifications and detail. Once model building codes are updated, C1861 will become a codified reference standard and minimum building code requirement as a companion to C1063.

The effort to develop C1861 culminated in new definitions and new illustrations of common lathing accessories, furring accessories, and fasteners. Updates to fastener specifications were made, and they are conveniently located in a new Table 3 in C1861 for reference (*Figure 4*), no longer buried in C1063 text. Table 3 is now the convenient tool for locating and referencing stucco cladding-related fasteners.

Lathing accessories are specified in C1861 to be fabricated from galvanized steel, solid zinc alloy, PVC, CPVC, and anodized aluminum, with certain minimum thicknesses and other specified properties. In recent years, certain lathing accessories—especially where vulnerable to corrosive conditions—have been brought to the market fabricated from stainless steel to be a better corrosion-resistant material than what had been previously available. C1861 now specifies the use of stainless steel in Types 304 and 316 as an acceptable material for lathing accessories.

NEW TERMINOLOGY FOR C1861

At the inception of development for C1861, we first came to understand that while different lathing accessories serve different functions, they had not been thought of or categorized in that way previously. Consider any given lathing accessory to understand its essence: What is it intended to do, how does it do it, and the acid test—what would happen if it were omitted or modified to be something different?

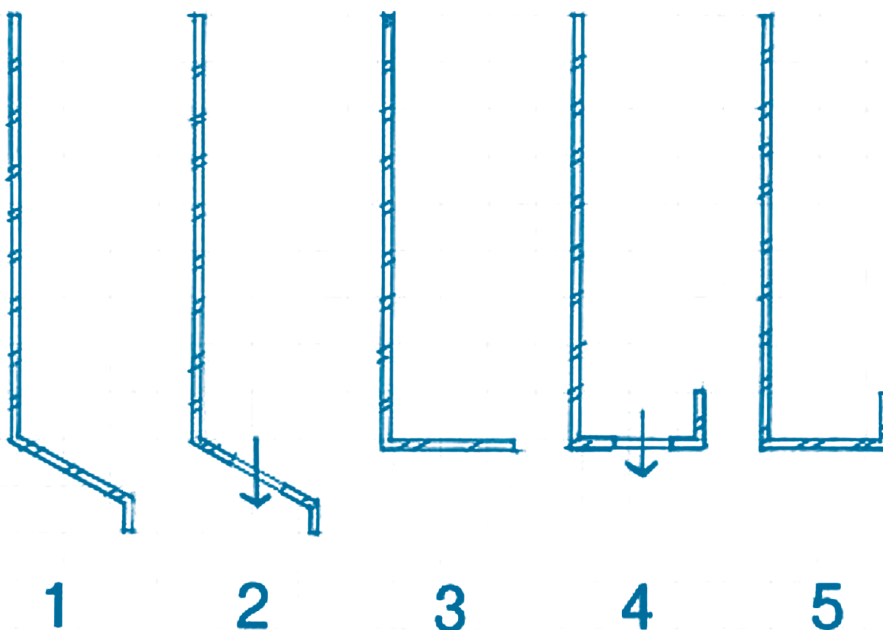


Figure 5 – Depictions of various drainage surface types.²⁵

The broad functions we identified included facilitating lathing installations, facilitating plastering, and improving the general functionality of a completed stucco cladding assembly. Lathing accessories needed to serve one or more functions such as assisting in controlling cement plaster thickness, reinforcing stucco corners, facilitating drainage, reducing cracking, isolating stucco from non-stucco materials (e.g., load-bearing members and penetrations), and providing a termination for cement plaster. We quickly recognized that many lathing accessories serve more than one function.

Another fundamental thing to understand about lathing accessories is that individually, a lathing accessory may incorporate different elements in different ways to serve a specific function. Think of an element as a specific feature of a lathing accessory that serves a specific function. Those same elements can be configured or combined in various ways to create different lathing accessories that serve different functions. These elements were not consistently named in the industry. C1861 names these various elements of lathing accessories to establish meaning and for consistency. For examples of elements, see *Figure 5* for “drainage surface,” *Figure 6* for “key attachment flange,” “capture flange,” and “ground dimension,” and *Figure 7* for “solid attachment flange.”

Because C1861 is primarily subservient to C1063, the terminology definitions in C1063 apply to C1861. Several newly defined terminologies were developed specific to C1861, which are contained in C1861. New definitions include the following.

3.2.1 capture flange, n—the narrow flange element of a lathing accessory that projects from a ground and extends onto the stucco surface to hide the shrinkage gap between the ground and stucco (*Figure 6*).

3.2.2 cement plaster panel area, n—the surface area of cement plaster between lathing accessory grounds. C1063 requires lathing accessory grounds to terminate cement plaster. For example, a window frame is not a lathing accessory because it is not made of cement plaster; it is a dissimilar material and, therefore, not an acceptable ground.

3.2.3 drainage surface, n—the element of a lathing accessory that facilitates divert-

ing water drainage from behind the stucco to the building exterior, which can be either sloped or non-sloped, perforated or non-perforated to facilitate drainage (*Figures 5 and 7*).

3.2.4 drip flange, n—the narrow element of a lathing accessory used to facilitate drainage, by extending from a drainage surface and directing water to the exterior of the stucco cladding.

3.2.5 fastener, n—fasteners are used to fasten lathing to framing members. Fasteners include nails, screws, staples, or power-actuated fasteners. Fasteners are also used to fasten certain lathing accessories. A wire tie is not a fastener; it is a tie.

3.2.6 flexible pleat, n—the flexible pleat element is unique to a control joint lathing accessory to accommodate movement of the cement plaster caused by portland cement shrinkage and thermal variations (*Figure 8*).

3.2.7 ground, n—the element of a lathing accessory that provides an

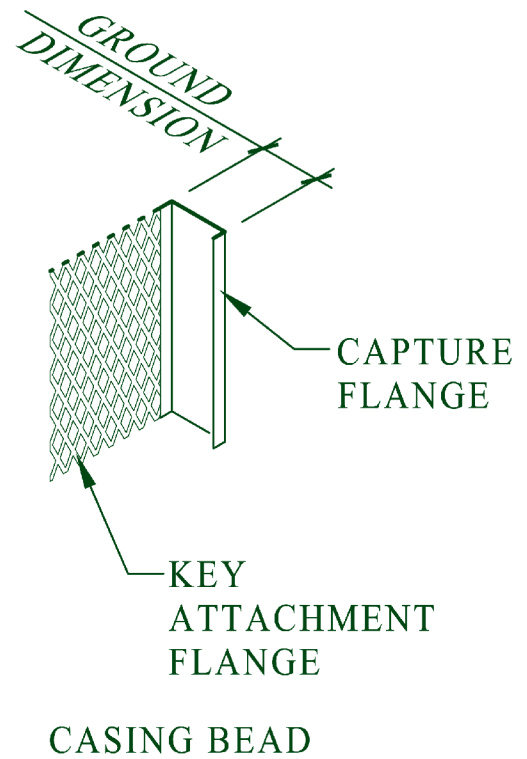


Figure 6 – Illustration of certain defined elements of a lathing accessory – key attachment flange, capture flange, and ground (screed) dimension. Illustration from C1861.

OPTIONAL
ATTACHMENT
PERFORATIONS

SOLID
ATTACHMENT
FLANGE

MOVEMENT
GAP

GROUND
DIMENSION

SLOPED,
PERFORATED OR
NON-PERFORATED
DRAINAGE
SURFACE

SOLID
ATTACHMENT
FLANGE

EXPANSION JOINT - HORIZONTAL

Figure 7 – Expansion Joint – Horizontal, with drainage surface and movement gap. Illustration from C1861.

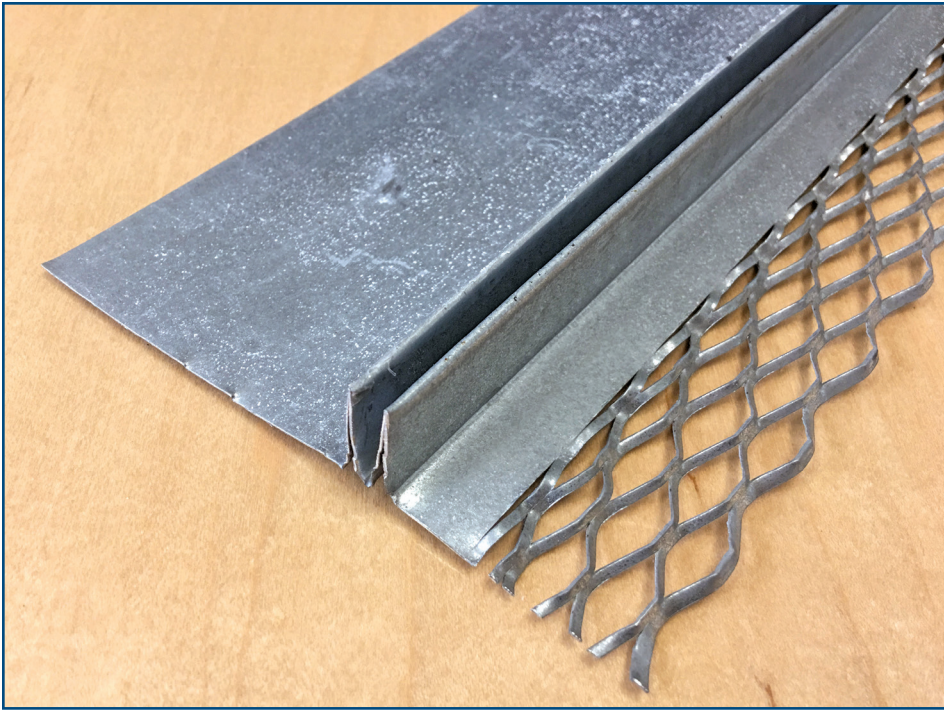


Figure 8 – Designated drainage screed/horizontal control joint, combination lathing accessory, with solid attachment flange, flexible pleat, and key attachment flange, in galvanized steel.

edge, end, or termination for a cement plaster panel area. The ground dimension is useful in assisting the plasterer to achieve the intended cement plaster thickness. A ground element is common to nearly every lathing accessory. “Screed” is synonymous with “ground” (Figure 6).

3.2.8 key attachment flange, n—the key attachment flange element is used to attach the lathing accessory and is foraminous (has lots of holes) which functions to embed the attachment flange and create a cement plaster key with the adjacent lath (Figure 6).

3.2.9 movement gap, n—the movement gap element is unique to an expansion joint lathing accessory that accommodates movement of the stucco that is caused by building or substrate movement and reduces cracking (Figure 7).

3.2.10 screed, n—“screed” is just another word for “ground.”

3.2.11 solid attachment flange, n—the solid attachment flange element of a lathing accessory is always installed under the lathing and is commonly used to facilitate drainage where the water-resistive barrier overlaps the solid attachment flange (Figure 7).

LATHING ACCESSORIES AND FASTENERS ILLUSTRATED IN C1861

C1861 is a product specification, describing and specifying common generic lathing accessories, furring accessories, and fasteners, whose installation requirements are specified in C1063. Significant attention was given in C1861 to the stylistic illustration of common generic accessories and fasteners by “depicting their functional elements in relationship to each other” and to avoid promoting proprietary products as a minimum building code requirement. Proprietary lathing accessories, furring accessories, and fasteners will intentionally look somewhat different from the generic illustrations in C1861, and will be in greater detail, but their functional elements should be very similar. Because of the generic nature of C1861, variations of lathing accessories illustrated within the standard are acceptable when the function and performance are equal to the illustrated accessory.

This is an appropriate opportunity to discuss and clarify the naming of lathing accessories through time. Now and in the past, manufacturers of many lathing accessories have assigned a number such as a #12 drip screed, #40 expansion joint, or a #66 casing bead. Other manufacturers have assigned names or acronyms such as a PCS or Soffit Drip. These monikers have

become ubiquitous in many circles, but they are not consistent among manufacturers, regions, or craftspeople. Recognize that these names and numbers were assigned by specific manufacturers for their line of proprietary products. To some extent these lathing accessory numbers and names have become common and recognized amongst different manufacturers, but this is not universal, and conflicts among different manufacturers’ lathing accessory nomenclatures are known to exist. C1861 currently uses a simple descriptive naming system to be generic and to promote a universal consistency for use in the industry.

Due to space limitations, this paper and presentation will not cover furring accessories such as for suspended ceilings or Z-furring for walls and will only briefly discuss select fastener topics. For more information about those items, please reference C1861. C1861 categorizes lathing accessories according to their primary function in the groupings noted below.

Lathing Accessories to Facilitate Drainage

Lathing accessories that promote drainage have developed significantly in recent years and become important to the functionality and success of stucco cladding assemblies. A lathing accessory that promotes gravity-assisted drainage is configured to divert liquid water from the water-resistive barrier behind the stucco cladding to the exterior surface of the cladding. The drainage screed includes a solid attachment flange that is overlapped by the water-resistive barrier. Water then diverts to the exterior of the cladding over a sloped and solid drainage surface or a drainage surface with drainage perforations.

Weep Screed. This is a type of drainage screed that primarily provides a means of drainage for the stucco cladding above it, required to be located at the bottom of weather-exposed, exterior wood- or metal-framed walls that include a water-resistive barrier. The weep screed functions to control cement plaster thickness and provides a termination for a cement plaster panel area. A weep screed must have a solid vertical attachment flange 3½ in. (89 mm) long minimum, and a drainage surface (Figure 9).

Designated Drainage Screed. A type of drainage screed that primarily provides a means of drainage for the stucco cladding above it. It is located at various weather-

exposed exterior wood- or metal-framed walls that include a water-resistive barrier at locations as a designer specifies, in addition to the weep screed. Important recommended locations for the designated drainage screed may include floor lines (or story-height intervals) of multi-story buildings to provide redundant drainage, at soffit corners, above wall openings, and at projections. The designated drainage screed is useful to control cement plaster thickness; to separate stucco from dissimilar materials, load-bearing members, and penetrating items; and to provide a termination for a cement plaster panel area. The designated drainage screed must include a solid vertical attachment flange and a drainage surface.

Studying the C1861 illustrations, one can easily recognize that a given lathing accessory is a combination of specific elements as previously defined. This opens the door to the creation of a wide variety of other combinations of these elements to develop new lathing accessories for specific purposes. An example of this is the recently developed Designated Drainage Screed/Horizontal Control Joint, which conjoins a horizontal drainage screed and a control joint lathing accessory into a single combination lathing accessory with multiple functions. This lathing accessory is one of several water management-related lath-

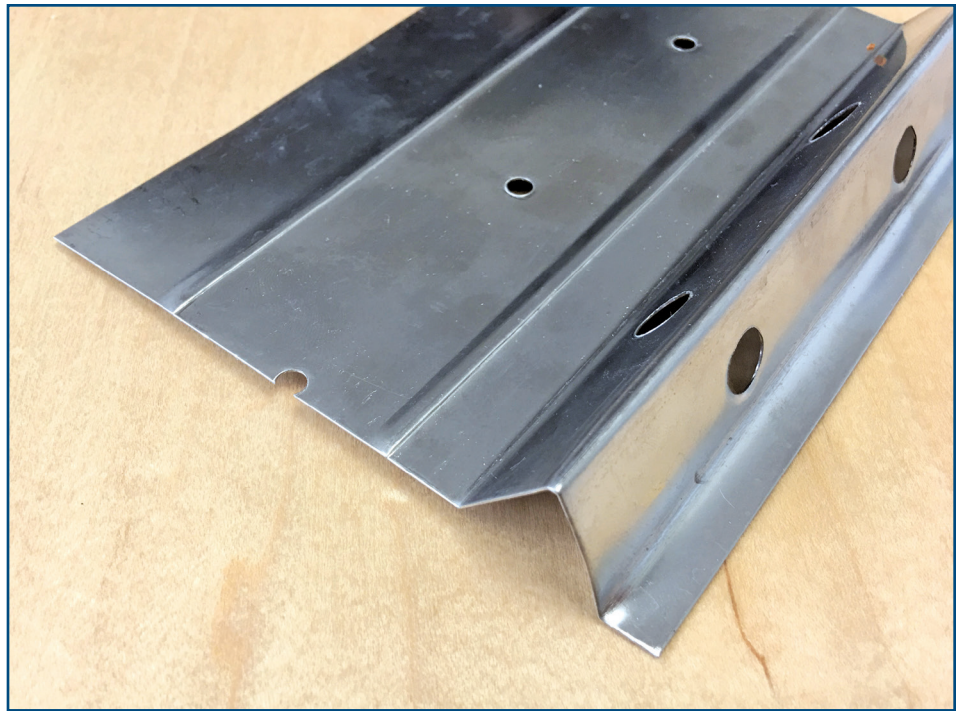


Figure 9 – Weep screed in stainless steel.

ing accessories developed and brought to market by Don Pilz of Cemco under *Patent US2008/0016808 A1*²⁶ (Figure 8).

A discussion for many years in the stucco industry has been centered around the purpose of the perforations (holes) in the drainage surface of weep screeds. The holes allow mortar extrusions to form through the perforations, which some say blocks

water drainage. Others opined that the purpose of the holes was to key the plaster to the screed to minimize the visible gap between the edge of the stucco and the screed. Performance testing of drainage screeds was completed, peer reviewed, and published in 2015,²⁵ which verified that the perforations—even when filled by hardened mortar extrusions—still allowed drainage through the perforations, or technically around the mortar extruding through the drainage surface perforations. The lesson learned is that holes in a drainage screed—even if filled with mortar—allow drainage and do not impede it. The mortar necks down as it extrudes through the hole, and a watertight seal between the mortar and the screed is not created (Figure 10).

Lathing Accessories for Casing

Casing Bead. A screed that primarily provides a termination for a cement plaster panel area. It helps control cement plaster thickness and separates stucco from dissimilar materials, load-bearing members, and penetrations. Casing beads are available with either a key attachment flange or solid attachment flange for different purposes, and may include a perforated drainage surface if the screed serves a drainage function.

A pair of casing beads with key attachment flanges oriented back to back, and a flexible element between them similar to a



Figure 10 – Mortar extrusion through weep screed drainage surface perforation (weep holes).

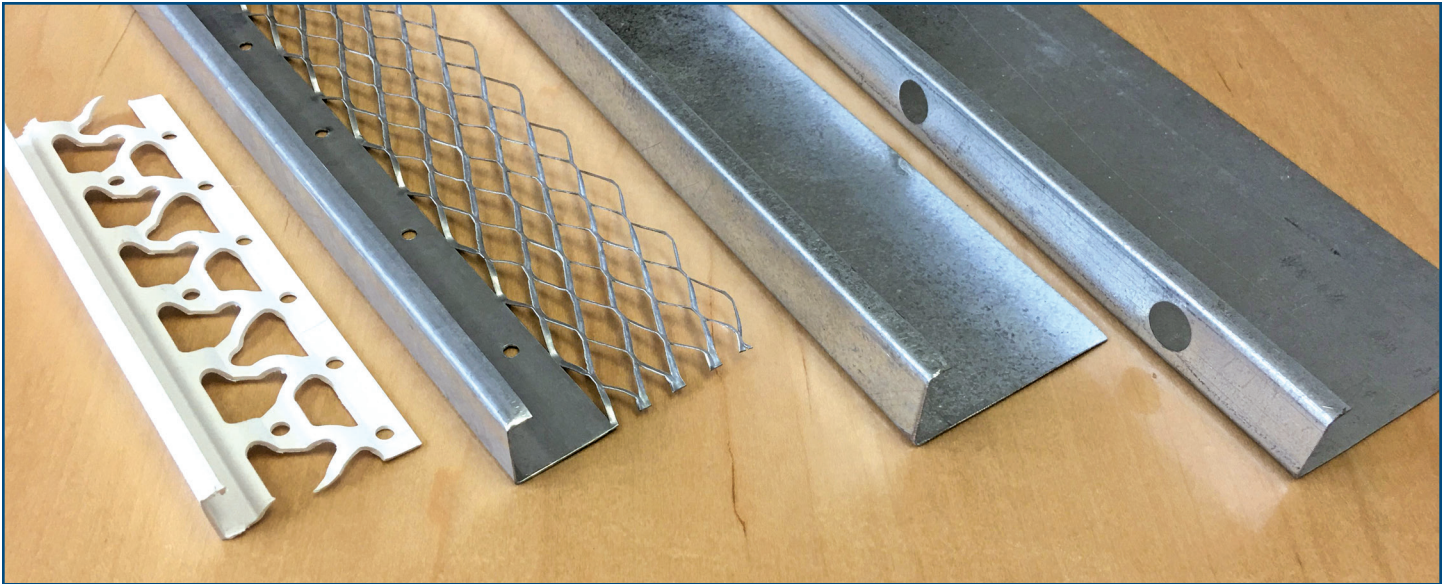


Figure 11 – Casing beads. Left to right: key attachment flange in PVC (courtesy of ClarkDietrich/Vinyl Corp.), key attachment flange in galvanized steel, solid attachment flange in galvanized steel, and solid attachment flange with perforated drainage surface in galvanized steel. Note each casing bead depicted has a capture flange and functions as a ground.

pleat, may also function as a control joint lathing accessory. A pair of casing beads with solid attachment flanges oriented back to back, with a movement gap between them, may also function as an expansion joint lathing accessory (Figure 11).

Lathing Accessories to Reinforce Corners

Internal Corner Reinforcement. An internal corner reinforcement lathing accessory is primarily used to reinforce internal stucco corners with expanded sheet metal lathing that cannot easily transition through internal corners. Sometimes referred to as “cornerite” (a proprietary product name), the key attachment flanges for internal corner reinforcement must be 2 in. (50 mm) wide minimum and formed to an interior angle between the flanges wider than 90°.

External Corner Reinforcement. The family of external corner reinforcement lathing accessories is useful to reinforce external stucco corners. The external corner reinforcement lathing accessory is available in galvanized and stainless steel sheet metal, in galvanized and stainless steel welded wire, and in extruded PVC. Sometimes referred to as “cornerbead” or CornerAid® (a proprietary product), external corner reinforcement accessories help control cement plaster thickness and provide a termination for a cement plaster panel area. The key attachment flanges for external corner reinforcement must be 2-½ in. (63 mm) wide minimum and formed to

an interior angle between the flanges less than 90°.

Lathing Accessories to Reduce Cracking

Expansion Joints. A lathing accessory primarily used to accommodate movement of the stucco cladding assembly caused by movement of the building or its components greater than cement plaster shrinkage and thermal movement. Its ground function as a screed to help control cement plaster thickness, and it reduces cracking by separating cement plaster from dissimilar materials, load-bearing members, and penetrations. It provides a termination for a cement plaster panel area. An expansion joint lathing accessory is constructed from two or more separate pieces with solid attachment flanges and a movement gap and is part of an expansion joint assembly.

Expansion Joint (Horizontal). Horizontally oriented expansion joint lathing accessories mounted to a weather-exposed wall must also facilitate drainage (Figure 7).

Expansion Joint (Vertical). Vertically oriented expansion joint lathing accessories mounted to a weather-exposed wall must have watertight seals to prevent water penetration.

Control Joint. A lathing accessory primarily used to reduce cracking resulting from portland cement plaster shrinkage while curing, and thermal movement while in service. It is a screed that helps control cement plaster thickness, and it functions

as a termination for a cement plaster panel area. A single-piece, prefabricated control joint lathing accessory (or paired casing beads) will always have key attachment flanges and a flexible pleat and is part of a control joint assembly.

The original control joint lathing accessory has a flexible pleat in a sectional profile of the letter “M” and is referred to as the “Double-V” (not illustrated in C1861 or in this article). While the Double V control joint lathing accessory is still available, it was superseded by an improved control joint lathing accessory introduced in 1978 by the Keene Corporation, which has capture flanges on each side of the control joint lathing accessory and is referred to as the “Double-J.” The capture flanges of the Double J cover the separation gap between the flexible pleat and the adjacent edges of stucco, which looks much better and conceals the potential water path. No patent is known to exist for this improved control joint lathing accessory (Figure 11).

Lathing Accessories Not Included in C1861

Here it is appropriate to provide a word of caution about certain lathing accessories, furring accessories, and fasteners available in the marketplace but not indicated in C1861. It’s a familiar tune: just because an item can be manufactured and sold to you, that does not make it functional, correct, or code compliant. A case in point is the casing bead with a key attachment flange that

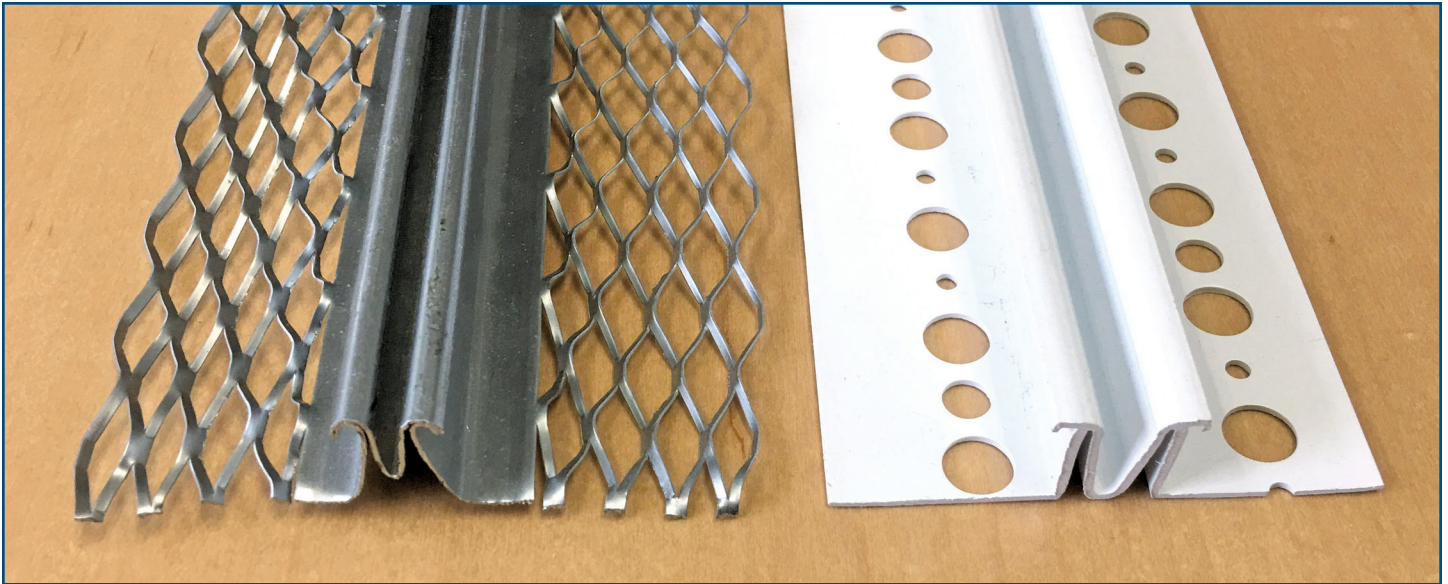


Figure 12 – Control joint lathing accessories, “Double-J” profile, with key attachment flanges and capture flanges, in solid zinc alloy (left) and extruded PVC (right).

includes a perforated drainage surface and capture flange, which cannot be installed in conformance with building code requirements and should not be on the market. In some regions of the U.S., this lathing accessory is used as a weep screed and installed over the water-resistive barrier, and this lathing accessory installed in this way does not comply with minimum building code requirements. C1063 and C1861 require that a weep screed must have a solid attachment flange 3½ in. wide, and the water-resistive barrier must be installed to lap over this solid flange, which promotes drainage.

A range of specialty lathing accessories and channel screeds (sometimes called “reveals”) are available in the marketplace but are not included in C1861. These specialty lathing accessories can be found in manufacturers’ catalogs and are most typically used by architects for aesthetic reasons or other specialty purposes. Channel screeds and other specialty lathing accessories are not included in C1861 because their functionality and limitations are not universally accepted or understood in the industry, and their specific installation requirements are not included in C1063. Where installation requirements for a lathing accessory or furring accessory are not included in C1063, lathing accessory manufacturers must provide installation requirements, usage conditions, and limitations to their products until the requirements become broadly accepted and ubiquitous for similar products. At that point, the

requirements can be included into C1063. Where C1063 or C1861 do not address the manufacturers’ requirements, manufacturers may also obtain code evaluation reports for proprietary lathing accessories for gaining building official approval to use specialty lathing accessories.

Fasteners

In C1063, fastener specifications—nails, staples, screws, and power-actuated fasteners—were scattered about within the text, and retrieving the information was challenging. Fasteners—similar to lathing accessories—are a product, and their specifications did not belong in an installation standard. A decision was made to include fastener specifications in C1861 after much discussion in the ASTM C11 Stucco Work Group. Some fastener specifications from C1063 were obsolete or incomplete. Screws required two separate reference standards, but nails and staples had none. C1861 now references ASTM F1667 as the nail and staple

reference standard. Power-actuated fasteners are controlled by code evaluation reports and require approval of the authority having jurisdiction (typically the local building official), and now those requirements are clearly indicated. C1861 collects and tabulates fastener specifications for lathing and furring installation into Table 3, which is a convenient format for ease of reference (Figure 4).

Construction adhesive, which can be an effective and convenient method for attaching lathing accessories to concrete and concrete masonry, is a recent new “fastener” for use in C1063 and is specified in C1861.

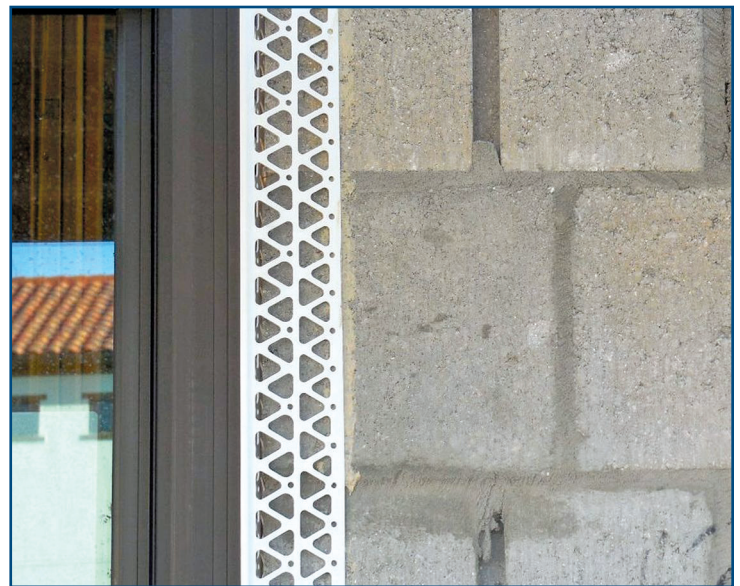



Figure 13 – PVC cornerbead attached with construction adhesive. Photo courtesy of G. Michael Starks of In-Spex, LLC.

Where lathing accessories such as corner beads are installed over concrete masonry, mechanical fasteners can spall the substrate—particularly at external corners. The adhesive needs to be suitable for exterior use and compatible with other materials in the stucco cladding assembly, but it cannot be an expandable foam-based adhesive. The adhesive bonds the accessory to the wall, and once the cement plaster has hardened, the adhesive serves no functional purpose. Another benefit is that in corrosive environments, the adhesive will not corrode as it may with metallic fasteners (Figure 13).

EFFECTIVE USE OF C1861

C1861 is a product standard, and C1063 specifies the requirements for installing each different type of lathing accessory, furring accessory, and fastener used in stucco cladding assemblies. C1063 specifically references C1861 for lathing accessories, furring accessories, and fasteners for other products that C1063 relies on, such as for lathing products. C926²⁷ is the application standard for portland cement-based plaster and references C1063 when plastering over lathing is required.

For designers, C1861 provides the descriptions and requirements for lathing accessories, furring accessories, and fasteners. The illustrations may be a reference for including accurate depictions of these items in construction detailing, a suggested generic nomenclature for specifications regarding each lathing accessory, and a source for identifying specific manufactured products that meet C1861 requirements.

For manufacturers and craftspeople, the descriptions and nomenclature of these lathing accessories are uniform, consistent, generic terms that may become commonplace over time in manufacturers' catalogs and on the jobsite. 

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