

▶ Comparing VTWC Soffit Lath and Traditional Rib Lath

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Hi-Rib expanded metal lath was developed and used for stucco soffits and ceilings for many decades. However, this lath was always susceptible to cracks forming after curing along some of the ribs or at the longitudinal overlaps. Since there were no alternatives, the industry lived with these problems for all these years.

The cracking is usually caused by shrinkage strain during curing. The reasons that Hi-Rib is more susceptible to cracking are:

1. The ribs are continuous, solid sheet metal with 3/8" depth spaced every 4 inches. If the plaster thickness is 3/4", then half the plaster is interrupted by the solid rib and is discontinuous. The ribs create score lines in the stucco and will act like score lines in sidewalks to create weak zones where cracks can form.
2. The stucco that is pushed through the expanded metal zone is a series of rivulets at each opening. They are discreet and do not flow back together to create a monolithic matrix. The result is a series of these rivulets that may be loosely attached to each other but have very little strength. Hence the stucco in this zone is very weak under tensile stress and cannot function as solid stucco.
3. Some of the Hi-Rib laths come with kraft paper backing to prevent blow through when pumping the stucco. This kraft backer exacerbates the problem since now there is limited stucco that can pass through and past the expanded metal. Now the area behind is void of stucco which is supposed to be there. With 3/4" stucco with 3/4" plaster stops, this results in the majority of stucco thickness being nominally 3/8", and the only area with 3/4" thickness is at the ribs themselves. Such a disparity in stucco thickness (from 3/4" to 3/8"), is obviously more susceptible to shrinkage cracking.
4. At the side overlaps with two layers of expanded metal, there is effectively blinding whereby the stucco cannot be easily forced through both layers and lock the laths together at the lap joint. Hence, another weak point in the installation.

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OVERCOMING DEFICIENCIES

In 2000, Structa Wire Corp (SWC) witnessed these problems on many job sites and set out to design a soffit lath that would overcome these deficiencies. The desire was to utilize a welded wire mesh that would have wire trusses, would have larger grid openings than the Hi-rib, and would have a backing paper that would move to the backplane when plaster was applied. After numerous designs were evaluated and tested, a successful wire lath for soffits was developed and patented in 2001 (USP 6820387 – Self-Stiffened Welded Wire Lath Assembly).

The SWC V-Truss Wall and Ceilings lath overcame the deficiencies in Hi-Rib laths in the following ways:

1. Since the ribs are made of wire instead of sheet metal, the ribs are open and stucco flows through the rib sections and becomes a monolithic full thickness of stucco. There are no score lines or disruption of the stucco at the ribs.
2. The stucco flows easily through the larger grid openings and forms into a continuous plane of stucco on the back side of the lath, rather than the group of individualized rivulets. This full thickness of stucco is able to provide added tensile strength.
3. The backing paper is designed to float to the backplane of the lath when plaster is applied. In this location, it becomes a limiting device which controls the thickness of stucco, especially with open framing which is common with soffits. This creates an even thickness of stucco which is ideal to prevent cracking.
4. At longitudinal overlaps, the plaster is easily able to pass through the larger mesh openings and pass through each layer of mesh. This stucco effectively locks the two sheets together. The backing paper is stopped short on each side and wrapped around the last rib and glued onto itself. This provides a clean wire to wire lap without any paper blockage. Further, on one edge there are perforated lines on the paper for easy removal of paper if so required.
5. The kraft backing paper has a series of small holes punched. These provide additional keying and locking of the stucco to the backing. Combined with the wire grid pattern, the result is much less fallout than that experienced with Hi-Rib. Although this doesn't affect cracking performance, it does reduce the time that plasterer has to go back and repair these fall out areas.

The V-Truss Wall and Ceilings lath has been on the market for over 15 years. During this period, the results and benefits of a dramatic reduction in soffit cracking have been proven. Further, tests in the laboratory have also quantified and verified the stronger performance between the two lath types. This is at both the ribs and along the longitudinal lap joints.

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Further to the cracking issues, there are questions raised about fire rating of stucco soffits and questions about insulation. Comments on these are:

1. Fire rating – soffits are normally vented especially along the eaves and these vents would affect the fire rating. With the increase in interface forest fires, fire rated soffit venting has now been developed. These are of two types – mechanical type with fusible links that mechanically close the vents. Or chemical type with intumescent coatings, where the coating foams with heat and seals the vented opening. Both types have fine mesh spark arrestors to stop embers from being drawn in, prior to reaching their trigger temperatures. Therefore, with these devices, the stucco soffits can be vented and still meet the historically designated fire ratings.

2. Insulation – normally eaves are not insulated since there is not conditioned space above. Rafter vents are installed to prevent ceiling insulation from blocking air from passing from the soffit vent to the attic space above the ceiling insulation. With flat roofs, space is left between the insulation and the underside of the roof. There are a number of ways to vent outdoor air into these spaces, and these would be fire rated vents as described above.

In summary, the SWC V-Truss Wall and Ceiling lath overcomes the deficiencies of Hi-Rib laths and provides a now proven method to continue to use stucco for soffits and ceilings. Further, there are no other devices that can be used to achieve full fire ratings with vented soffits, and also without compromising insulation requirements.

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