

# An Abstract of RCI's New Architectural Sheet Metal Flashing Course

By Russ Raymond, RBEC, RRO, CDT, CEI

Since its inception, RCI Inc. has had a history of providing world-class educational programs on building envelope topics. Expanding on that tradition of success, the “Architectural Sheet Metal Flashing” course is currently under development and will be ready for presentation at the upcoming RCI International Convention and Trade Show in Anaheim, California, as an auxiliary seminar.

The RCI taskforce for this project is comprised of subject matter experts Jeff Garrison, RRC, RWC, PE; Remo Capolino, RRC, PE; Ed Williams, RRC, RRO; Joe Heidt; Chair Russ Raymond, RBEC, RRO; and RCI Director of Educational Services Rebecca Cunningham. This team features decades of experience in architectural sheet

metal fabrication, installation, design, and assessment in a variety of geographic locations across North America. Their experience will provide this course with a hands-on feel, with many examples of how-tos as they relate to sheet metal fabrication and installation.

For over a year, this team has worked to compile the course, which is built upon and includes the significant work of RCI and the Sheet Metal and Air Conditioning National Association's (SMACNA's) joint publication, the *Architectural Sheet Metal Quality Assurance Guide*. This new course features guidance and instruction related to the design and assessment of architectural sheet metal flashings for the entire building envelope, including roofs, exterior walls, and waterproofing systems. The course references proven industry standards, such

as the *SMACNA Architectural Sheet Metal Manual* and the National Roofing Contractors Association's *Roofing Manual*, as well as numerous material-specific (i.e., Brick Industry Association, EIFS Industry Members Association [IMA], etc.) and ASTM standards.

The course content focuses on material selection for various applications and environmental conditions;

sheet metal joinery, including soldering and expansion provisions; and detailing of sheet metal flashing assemblies, drainage assemblies, and penetration flashings.

The initial portion of the course provides a review of criteria utilized for sheet metal flashing material selection. It is apparent that service exposure of a flashing—whether it be exposed or concealed—is a primary factor for consideration. Coastal areas, environments requiring the use of deicing salts, and areas where there is harsh chemical manufacturing present significant durability and performance challenges to flashing performance. Industry experience indicates that durable flashings in these harsh environments are fabricated from Type 316 stainless steel and prefinished/anodized aluminum.

Durability and longevity are of critical importance in concealed conditions, especially in masonry wall systems where the service life expectations exceed 50 years. The initial higher cost of copper and stainless steel flashings offers a much greater value when considering the cost of repairing or replacing a lesser-quality system consisting of heavy cladding system components (i.e., brick or stone veneer, etc.). (See *Figure 1*.) Considerable costs may accumulate when undertaking remediation tasks, including removal of the existing cladding system and supporting overlying wall sections, making proper durable repairs or flashing replacement, and replacing or reinstalling the overlying cladding system. It is apparent to value-minded individuals that doing it right the first time is much less expensive than proceeding down a remedial path after selecting a “value-engineered” option.

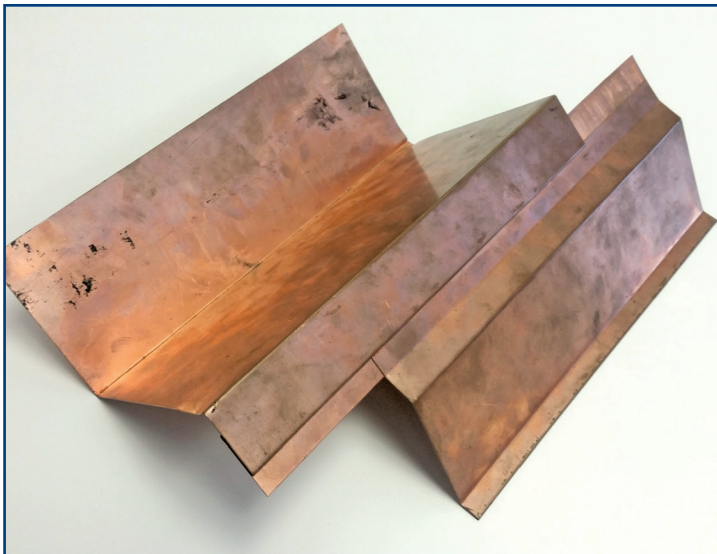


Figure 1 – Fabrication of two-piece copper through-wall flashing assembly.



Figure 2 – Improper patch to existing copper gutter.

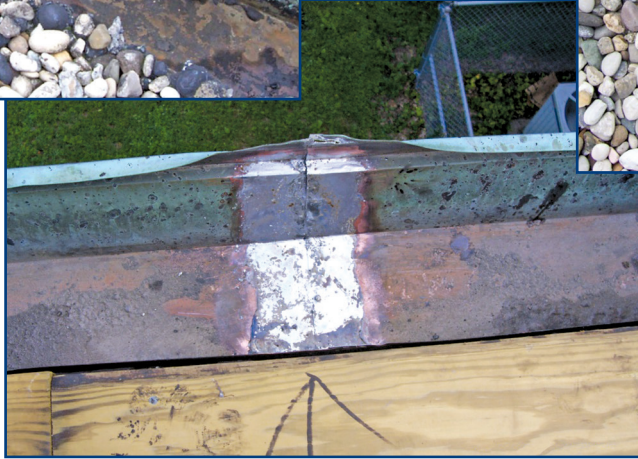


Figure 3 – Pre-tinned copper gutter after initial patina removal.



Figure 4 – Completed proper repair of copper gutter.

Due to its significance in the industry, one of the most prominent portions of the course is related to soldering of architectural metals. Using decades of industry experience in both construction and consulting, as well as historical references on the subject, the task force has assembled a comprehensive description

of the soldering process. As our experience and research indicate, the industry does not have an up-to-date technical manual

related to soldering architectural metal. Most current work on the soldering subject is focused on the electronic manufacturing

industry; therefore, the bulk of the reference material for the course was taken from pre-1960-era books and trade manuals, many of which are currently out of print.

Our work on the subject develops the topics of proper flux and solder selection, joint assembly and preparation, the soldering operation, and the methodology for repairing/patching existing soldered joints. (See Figures 2, 3, and 4.) For example, in

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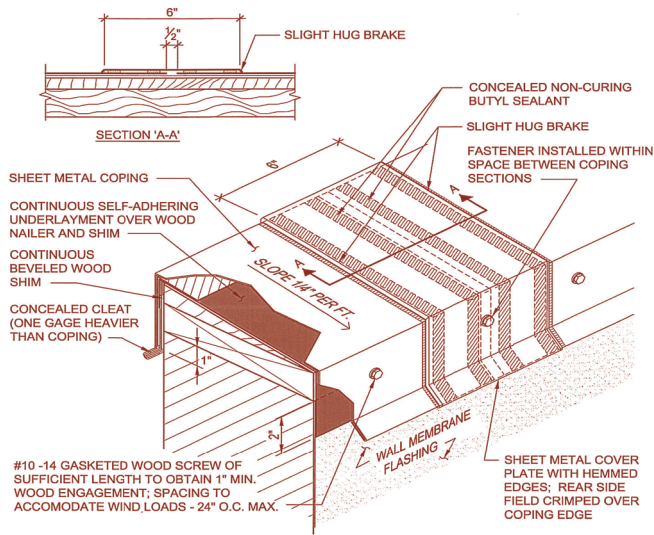


Figure 5 – Graphic illustrating a common sheet metal coping assembly with cover plate.



Figure 6 – Coping with concave profile retaining water.

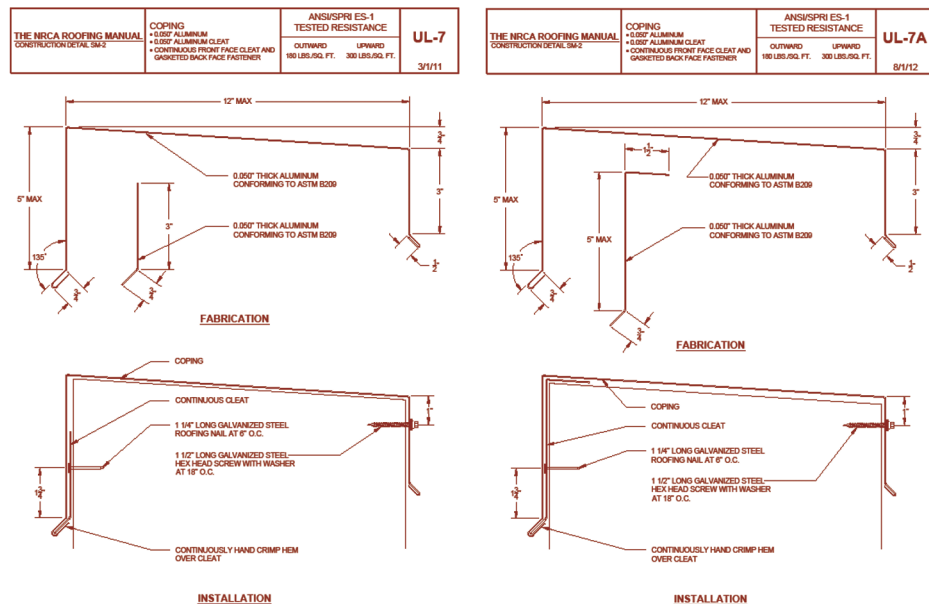



Figure 7 – NRCA coping profiles for ANSI/SPRI ES-1 compliance.

many locations in North America, chloride-based fluxes are often utilized for soldering stainless steel. While it may demonstrate adequate performance in many applications, the stainless steel manufacturers' associations recommend a phosphate-based flux. This flux does not contain chlorides, minimizing the potential for post-soldering corrosion. It has demonstrated excellent performance with less corrosion at the soldering site, but is not commonly used nationally. The graphic and narrative descriptions of proper remediation of failed solder joints are likely to be valuable resources to those who do not have intimate knowledge of architectural sheet metal.

Finally, the course section entitled "Detailing" provides design recommendations and common design issues as they relate to sheet metal flashing. The course reviews fabrication tolerances for fabricated flashing components, such as coping-to-cleat and headlap dimensions of flashings over various cladding and roofing systems (Figure 5). Additional coping attributes are identified, such as sloping the near horizontal top of the coping (Figure 6), preference for continuous cleat and mechanical fasteners over other accessories that may be more easily displaced during post-construction maintenance activities, and various detailing methods as they relate to compliance with ANSI/SPRI/FM 4435 ES-1 (Figure 7).

While there are several methods of compliance, each method offers various levels of performance and specific integration considerations with adjacent systems. For example, several options are indicated for integrating flashings at the head and sill of curtainwall assemblies with glazed-in sill flashings and copings featuring an inward return leg that is mechanically attached and sealed to continuous concealed anchor clips. These alternatives provide designers with options to consider when designing or evaluating design of curtainwall and storefront glazing systems.

Throughout the course, there is further development of flashing assessment techniques, including the use of tools and field manipulation of various flashing components to verify seals and adequate metal attachment.

This course will be offered for the first time as an auxiliary seminar at the 2017 RCI International Convention and Trade Show. If you wish to enhance your knowledge of architectural sheet metal, we encourage you to register for and attend the course and share the knowledge and sheet metal expertise of RCI subject matter experts. 



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Russell Raymond, RBEC, RRO, CDT, CEI, has over 25 years of experience in the sheet metal contracting and building envelope consulting industries. He is currently a senior building science consultant and department manager for Morrison

Hershfield in Houston, Texas. He has designed and specified roofing systems for major petro/chem clients, museums, and hospital systems, including numerous specialty flashing applications. Raymond has also performed numerous investigations pertaining to sheet metal, roofing, waterproofing, and cladding failures.