



# Retrofit Roofing Case Study: Winchester High School Receives MBCI NuRoof® System

## Overview

The community of Winchester, Ind., was in desperate need of a new roof for its aging high school. Teachers and students were coexisting in an interior environment that was wet, humid and had a repulsive smell. The school board met with a number of people, including a conventional roof trade association and an architectural firm that specialized particularly in flat roof work. In January 2008, they elected to go with another flat roof on the high school.

However, the community was split over whether to use another flat asphalt roof or to use a sloped standing seam metal roof. In March 2008, Metal Roof Consultants attended a school board meeting and presented a sloped metal retrofit roof as an alternative to tearing off the existing roof and replacing it with another flat roof. The retrofit metal roofing system allows the existing roof to stay in place and constructing a new roofing system over the top of it.

## The Challenge

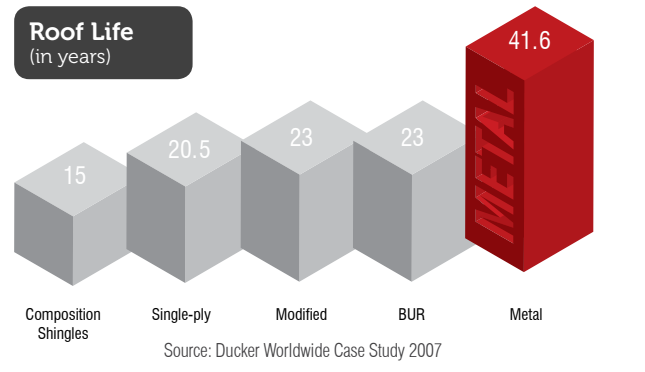
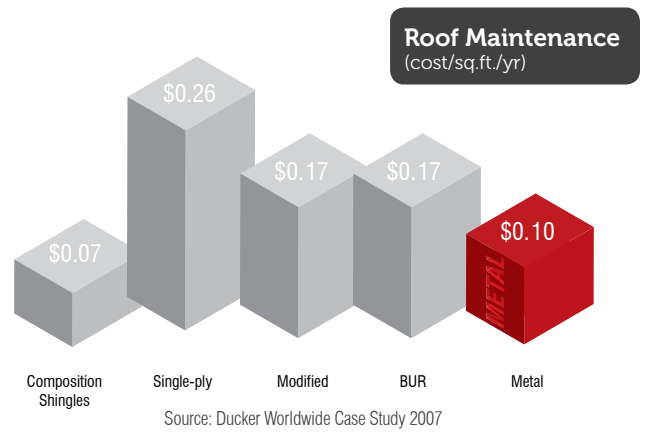
To provide a long-lasting roof that would permanently fix severe leakage issues associated with the existing flat roof on Winchester High School.

## The Solution

After the presentation by Metal Roof Consultants, it was decided that a retrofit metal roof system would be the best solution for the existing problem. MBCI, the leading manufacturer of metal roof and wall systems, was approved as the supplier for both the framing system and metal roof system for the 108,000 square foot project. Smarrelli Construction was chosen to do the installation. The contract price was approximately \$1.6 million, slightly less than the original estimate to remove and replace the existing flat roof.

The MBCI NuRoof Retrofit Roof System was installed over the existing roof's framing members to create a sloped plane. Six inches of unfaced fiberglass insulation were installed directly over the existing roof. This raised the insulating value of the roof from R-3.5 to R-22.5, which provided significant energy savings. It also allowed the existing roof to release its moisture through the glass insulation into the ventilated air in the new roof cavity.

Once the framing system was in place, a BattenLok® HS standing seam metal roof was installed over it. This option allowed school to stay in session while the new roof was installed. The metal roof was an ENERGY STAR® qualified Cool Roof color, which, when properly used considering the environment and the slope of the roof, can reduce energy consumption because of its ability to reflect and emit the sun's energy, providing significant cost savings.





Additionally, this solution eliminated the need to deposit the existing roof into the local landfill, which recent stats show that 7 to 10 percent of U.S. landfill space has gone to roofing waste over the last 40 years (ADPSR 1998-2007 Corps of Engineers Study). Metal roofing also allows for little to no maintenance. The painted roof system is guaranteed for 40 years and the roof is likely to last much longer. MBCI also guarantees that the roof will not leak for a minimum of 20 years.

## The NuRoof® Retrofit System

The NuRoof® Retrofit Framing System utilizes light-gauge (16 ga. to 12 ga.) steel framing, which is installed directly over the existing roof's framing members to create a sloped plane. Regardless of whether your roof substrate is steel, wood or concrete, MBCI's NuRoof® system can be employed to satisfy the building owner's requirements. MBCI has the experience required to design the retrofit framing system that will comply with the original load requirements of the existing roof.

The existing roof's physical footprint, framing system and other rooftop conditions will most likely control the new roof's geometry. A low-slope application (¼:12 to 2:12) is typically driven by economy and designed to discharge rainwater from the roof. High-slope applications (greater than 2:12) are also designed to improve and update the look of an existing building in conjunction with improving the performance of the roof.

Once a NuRoof® framing system has been installed, one of MBCI's standing seam metal roofs is typically installed, creating a ventilated attic space.

## Standing Seam Metal Roof Systems

MBCI offers two types of standing seam metal roof systems – vertical leg and trapezoidal – which are of the most durable and weathertight roof systems available in the industry. Both systems can be used for new construction or retrofitting an existing building.

The vertical leg standing seam roof panels from MBCI blend the aesthetics of an architectural panel with the strength of a structural panel. These panels have earned several UL uplift ratings, assuring the reliability of performance. They also provide flexibility to meet design challenges. Each of these systems is designed to be installed over open framing. BattenLok® HS is a vertical leg system.

Trapezoidal standing seam panels are available as a snap-together system or field-seamed system. They allow for strength, durability and weatherability. The standing seams are three inches above the lowest part of the panel, well above the water level as it flows off the roof. With a recommended minimum slope of ¼:12, the trapezoidal systems can be used on all types of construction, including metal, masonry or wood.

RETROFIT BENEFITS	COST VS. SAVINGS
BUR (asphalt) Tear Off & Replace Retrofit Roof Replacement	\$1.5M -\$1.6M <hr/> <b>&lt;\$100K&gt;</b>
Estimated Energy Savings (\$0.10 / sq ft x 108,000 sq ft)*	\$10,800
Estimated Reduction of Maintenance Cost (\$0.10 sq ft vs. \$0.17 x 108,000 sq ft)*	\$7,560

Estimated Savings based on not having to Reroof BUR (Asphalt) (Avg. BUR Reroof cost of \$3.75 / sq ft\* annualized based on 23 yr service life\* and 3.12% inflation rate)

\$35,695

**Estimated Annual Savings** **\$54,055**

Estimated Maintenance & Energy Payback of \$100K Initial Retrofit Cost Difference	5½ Years
Estimated Maintenance, Energy and Future Replacement Cost Payback of \$100K Initial Retrofit Cost Difference	2 Years

\*SOURCE: 2007 DUCKER WORLDWIDE REPORT



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