A Look at Historic Tile Roofs

Clay, or terra-cotta, tiles are among the most ornamental and distinctive roofing materials used in historic buildings. Their aesthetic qualities, including a panoply of shapes, colors, patterns, and textures, often make tile roofs prominent stylistic features of many historic structures. Nowhere is this more apparent than in Alfred, New York, a rural town located in the Southern Tier of New York State, settled primarily by Seventh Day Baptists, that is filled with terra-cotta tile roofs. More than one hundred structures bear distinctive orange-red roofs, powerful reminders of a terra-cotta industry that thrived in Alfred between 1889 and 1909. Two companies, the Alfred Clay Company and the Celadon Terra Cotta Company (which evolved into the renowned Ludowici-Celadon Company in Ohio) transformed local high-quality raw materials into a wide variety of clay roofing tiles.

Typically, terra-cotta roofs comprise a field of plain clay tiles covering the majority of a roof’s flat surface, with decorative tiles used along the peak of the roof. In more ornamental installations, the field tiles may have areas of patterning created by tiles of different shapes, dimensions, or colors. Around Alfred, terra-cotta tiles predominate, but there are many variations of clay colors, ranging from deep browns to pale pinks to buff or beige. By the end of the nineteenth century, as the use of glazed roofing tiles grew, blues, greens, and deep, nearly black, purples were popular colors.

Although clay tiles can last for centuries, the average life span of a terra-cotta tile roof is estimated to be about one hundred years. Many existing roofs in Alfred are approaching the end of their life spans. Community desire to preserve these roofs, and support from the Friends of Terra Cotta, generated a survey project that led to the publication of Roofs of Alfred, which contains valuable information about the history, manufacture, repair, and preservation of tile roofs. The Friends of Terra Cotta is pleased to share some of this information with readers of Common Bond.

Historical Background

The word tile does not often occur in the Bible; but that tiles were used in very ancient times, not only in buildings, but also for many Purposes for which we employ paper, there is not the slightest doubt, and this is particularly true in regard to Assyria in which country almost every transaction of a public or private character was first written upon a thin tablet of clay, or tiles, and then baked.

J. Durrah, who described in an 18th-century essay the art of tile making, noted that handmade tiles were often placed on roofs, and occasionally, one-of-a-kind pieces were pressed by hand into plaster molds. The Surface next to the plaster was then smoothed by hand so that it would match the machine-made surface of the plain tile. Occasionally, one-of-a-kind pieces were sculpted without using a mold.

This article was prepared by Susan Tunick, the President of the Friends of Terra Cotta, a national preservation organization, as well as an artist working in ceramic mosaics.

During the late-eighteenth and early-nineteenth centuries, clay tiles faced stiff competition from other roofing materials, including slate, and metals such as copper, iron, zinc, and galvanized iron. Clay tiles were more durable and more expensive than the materials and were less common in many areas. By the 1770s, tiles were being produced in the East, particularly in New York and New Jersey, and in the West at the California Mission of San Antonio de Padua. The acceptance of clay tiles was based partially on their durability, ease of maintenance, and energy efficiency. Clay tiles were also fireproof, a quality that made them particularly attractive in the crowded, tightly-packed cities of the English colonies. The tiles were used in London (1666) and Boston (1679) to lead to the creation of building and fire codes in several. Colonial cities, including New York and Boston, which encouraged the use of terra-cotta tiles for roofs because of their fireproof qualities.

Tile roofs are often prominent architectural elements of many historic buildings, as in Sacred Heart R.C. Church in Baton Rouge, Louisiana.

This tile roof rises raised, curved tiles, reminiscent of rhinoceros horns, to form diamond shapes. The darker, cross-shaped patterns are created by the insertion of dark brown tiles within the red field tiles.

Roofing tiles were made in a variety of shapes, as demonstrated in this illustration from A Practical Treatise on the Manufacture of Bricks, Tiles, Terra-Cotta, Etc. by Charles Thomas Davis.

The manufacture of clay roofing tiles was a fairly standardized enterprise. Shale, the primary raw material, was blast blasted, dug out by hand, and transported to the tile plant in horse-drawn wagons. Large crushing machines pulverized the shale and placed it in a pump mill, where it was mixed with water to form a homogenous mass of clay. The clay was extruded into wide strips and cut into bars of crude tiles called "blanks." These blanks were then put into pressing machines and formed into roof tiles of various sizes and shapes. Once formed, the tiles were placed on carts, put through a drying tunnel, and then loaded into the kiln. The tiles were baked at a temperature of about 1,000 degrees Fahrenheit, which produce a durable, fire-resistant product.

By the early twentieth century the manufacture of clay roofing tiles had become a complex industrial process. In 1908, the Celadon Terra Cotta Company operated eight presses. Five were run by power and the other three, used for moldings and mud units, were operated by hand. The principal power presses were self-efficient that daily production increased in size and quality. In the 1920s, they were put into operation. Ornamental tiles were either molded by hand, or the tile press was altered to produce an embossed design. Complex units, such as hip rolls, finials, creastings, and other ornamental pieces were pressed by hand into plaster molds. The surface next to the plaster was then smoothed by hand so that it would match the machine-made surface of the plain tile. Occasionally, one-of-a-kind pieces were sculpted without using a mold.

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Preservation of Historic Tile Roofs

Clay roof tiles, when correctly installed, need virtually no maintenance. In fact, it is not unusual for clay tiles to outlast the original building and be reused on another structure. To foster the preservation of these historic tiles, numerous factors contributing to the deterioration of the roof system are addressed. This includes the presence of wood shingles, damaged tiles, and vertical roof battens with which the tiles may be attached.

Most common failure in tile roofs is cause by a breakdown in the fastening system, which frequently consists of iron nails, although some roofs have wooden pegs. As second common failure is the support system, which must be strong enough to bear the load of the heavy tile roof. If metal flashings, gutters, and downspouts were made of a different material, the roof would be less resilient and less likely to withstand the pressure and contraction forces. The roof tiles are also exposed to weather conditions and kept in place by the tiles themselves, which are shingled onto the roof. The roof tiles are held in place by the tiles themselves, which are shingled onto the roof.

Properly assessing the condition of a historic tile roof is of significant importance. However, visual inspection by the building owner is a valuable preliminary step. Pay attention to all signs of wear and tear on the roof, including the presence of missing shingles and damaged tiles. A review of the roof deck and the condition of the roof sheathing is also important. If the roof deck is suspect or if the roof sheathing is not in good condition, a qualified professional should be consulted to determine the extent of the damage and the appropriate repair method.

Tileroofs were of f custom-made for specific buildings. Architects would submit roof plans that were unique to each building. Charles Bins, a renowned architect of Alfred University, reported on an article in The Clay Worker in 1904 that he planned for every hip and valley in the house. Every cut tile had a place in the plan and was marked accordingly. The tiles themselves were shaped and screened, and marked for fitting into the roof structure.

A wagon loaded with roof tiles was driven past the Salem s warehouse, and shipped by rail to the sites across the country.

Susan Tunic, President of the Friends of Terra Cotta, a national preservation organization, as well as a specialist in ceramic mosaics, prepared this article. The article examines the functions and characteristics of tile roofs. More than a century ago, the tile roofs were considered durable and aesthetically pleasing. However, the tiles have been subject to a variety of maintenance issues, including weathering and corrosion.

Tileroof being repaired. In this example, tiles salvaged from less visible areas are being reinstalled on the Primary Roof of St. Mary’s R.C. Church in Osswego, New York.