

Lakeport Plantation Restoration

Technical Report No. 5

The Shingled Roof





This photo shows the south side of Lakeport Plantation house before restoration began. At that time, the hip roof was covered with a corrugated tin roofing material.

The roof is one of the most important elements of a house. While serving as a shelter from rain, wind and sun, it also helps to define the architectural style of a house. Lakeport Plantation house was built with a hip roof design, with a gabled roof above the front porch and at the back of the house. The sloping ends and sides of a hip roof allow for the use of decorative molding on all sides of the house, making it suitable for many architectural styles. Also one of the strongest roof designs, the hip roof will withstand all types of weather.

The roof consists of not only what is visible to the eye, but other unseen components as well. Besides the roofing material, other parts of the roofing system are the rafters, the sheathing, and the flashing. These parts of the roof are not seen but are just as important. The rafters are the framework of the roof and give the roof its shape. The sheathing is the layer of boards that are nailed to the rafters to hold the roofing material and the flashing is strips of metal used as reinforcements to protect in areas where the roofing material cannot.

Evidence shows that the roof of Lakeport Plantation House had previously been covered with three different types of roofing material. Hand-split cypress shingles, found in the attic when restoration began, are believed to be the original roofing material. Machine sawn red cedar shingles were also found. However, there is not enough evidence to determine if this was a second roof or if they were used to



The photo at left shows some of the shingles that were found in the attic of the house when restoration began. The shingles to the far left are hand split cypress shingles that had never been used. The two shingles in the center, also hand split cypress, show signs of use and were probably part of the original roof. The cypress shingles were replaced by the galvanized stamped metal shingles.

patch the original cypress roof. Wood shingles were later replaced by a galvanized stamped metal shingle, although it is uncertain when. A galvanized corrugated metal roofing material replaced the metal shingles in the 1950's and remained on the house until restoration began.

The Lakeport Plantation restoration team was fortunate to find that some of the original roofing material still existed. There are ways to discover more about the original roof even if none of the original roofing material remains. Analyzing the original rafters, sheathing and nail patterns can help to determine what the original roofing material was. A particular method of sheathing, called skip sheathing, is used for wood shingles and the nail pattern will tell the size of the shingle and how much of the shingle was exposed. A tile or slate roof would have required a more substantial framing and bracing in the attic area to support a heavier roof. The wealth of the family the house was built for would also influence what type of roof was originally on the house.

Wood shingled roofs have been popular since the early settlers came to America. The thatched roofs influenced by their native European homelands did not hold up well to the New England weather and were soon replaced with the more durable wood shingled roofs. Timber was plentiful at that time and wood



The photo at right shows the restoration crew removing the corrugated metal roofing material from Lakeport Plantation house to get ready for the new cedar shingles to go on.



The photo at left shows the original cypress skip sheathing that was exposed when the corrugated metal roof was removed. Crudely cut, many of the boards still have the barked edges and are shaped like the trunk of the trees from which they were cut.

shingles were made from whatever type of wood was most abundant to a particular area. Early shingles were hand split to about a one inch thickness using a mallet and froe and then smoothed and tapered using a shaving horse and drawknife. Wood shingles continued to be hand split until the mid to late 1800's when water powered sawmills began producing machine sawn shingles. Machine sawn shingles can easily be distinguished from hand split shingles by the circular saw marks left on the shingles. Wood shingles were the most commonly used type of roof covering in the United States until the late nineteenth century when composition asphalt shingles became popular. Wood shingles remain popular today, but are less commonly used due to their high cost.

Corrugated metal roofs were popular in the United States from the mid-nineteenth century into the twentieth century. Metal shingles were developed in the late nineteenth century. Metal shingles could give the look of slate, tile or wood and they were lightweight, inexpensive and, unlike wood, they were fire resistant. Embossed metal shingles were popular for their decorative appearance. The raised pattern also contributed to the stiffness of the metal. Metal shingles were often painted on both sides to prevent against rust. Galvanized metal, a metal that has been coated with zinc, was also used for metal shingles. The zinc coating was used as a rust preventative. Metal shingles remained popular until the 1920's.



The photo at right shows the roof above the plantation office of Lakeport Plantation house. The roof was deteriorated and the original skip sheathing had to be replaced with new. The damaged rafters shown here were straightened and braced with new materials as well.



The photo at left shows the new cedar shingles being put on the roof of Lakeport Plantation house. Cedar shingles were used instead of cypress because of the high cost of cypress shingles.

The corrugated metal roofing material was removed from Lakeport Plantation house to expose the original rough sawn cypress skip sheathing which was used for the wooden shingles. Skip sheathing are boards that are typically about six to eight inches wide nailed to the rafters. They are spaced about two inches apart. The spaces are left between the boards to allow for ventilation so the shingles, once wet, can dry from both sides. If not allowed to dry thoroughly, the shingles will deteriorate more rapidly, shortening the life of the roof. The original boards used for the skip sheathing on Lakeport Plantation house were wide and crude with many of them still having the cypress bark on the edges. Some of the boards were shaped like the trunk of the tree from which they were cut, wide at the end and then narrowing, as the trunk of a tree would have. The skip sheathing and rafters above the plantation office were badly deteriorated due to moisture infiltration. The sheathing was replaced and the rafters were braced and straightened. The west porch roof also needed new sheathing, along with several smaller areas of the roof.

Some of the flashing was also exposed when the metal roof was removed. The flashing was a combination of tin and terne metals and it is uncertain if either material was the original flashing. Terne metal is a metal that has been coated with a lead and tin mixture and can be distinguished from tin by its dull finish.



The photo at right shows the copper flashing covering the ridges of the roof of Lakeport Plantation house. The flashing is used to protect the roof in areas where the shingles cannot; along the ridges, at the hip and in the valleys of the roof.

The photo at right shows the roof after completion. The ridge caps cover the exposed ridge flashing and give the roof a finished look. In this photo the cedar shingles have begun to change their color. The photo below shows an up-close view of the cedar ridge caps ready for installation.



Tin can last for many years but must be kept painted or it will rust. The flashing serves to protect the roof from water leakage in areas where the roofing material cannot. Flashing lays on top of the roofing material along the ridges and at the hip of the roof. Flashing in the valleys of the roof lays beneath the shingles. A method called step flashing is used where the chimneys protrude from the roof. Metal pieces are cut and shaped to slide under the edge of the shingles and protrude to lay against the side of the chimney. These pieces overlap and run up the roof alongside the chimney in a stair step fashion and protect the roof from leaking around the chimneys. The metal flashing was replaced with copper flashing. Copper material does not rust and will also last for many years.

Because the original wood shingles were cypress, it would have been historically correct to go back with the same type of material. Old growth cypress is extremely durable, as well, and the shingles would have lasted for many years. However, the cost of shingles made from old growth cypress was extremely high and, therefore, not feasible to the project. A western red cedar, more commonly used and less costly,



The photo at left shows the step flashing after it was installed on one of the chimneys of Lakeport Plantation house. The photo above shows individual pieces of the step flashing before being installed. The bent ends slide underneath the wood shingles and the rest of the flashing lays against the side of the chimney.



This photo shows some of the wood shingles where the roofing nails were driven with a nail gun to below the surface of the wood. Many of the shingles were cracked and damaged during installation, resulting in several leaks in the new roof. The first roof was completely removed and replaced with a second roof which was installed correctly.

was used instead. Attractive as it ages, cedar turns to a silver-gray color over time. Western red cedar is also rot resistant, which added to its desirability.

The new wood shingles are random width, taper sawn cedar shakes approved by the Cedar Shake & Shingle Bureau. The term shake is used to identify the modern machine cut shingles from hand-split shingles. Using the traditional method, the shingles were installed three layers thick with one-third of each shingle exposed. They were spaced about one-half inch apart to allow for the

shingles to expand when wet. Traditionally, felt paper is not used with wooden shingles. If the wood shingles and flashing are installed properly, felt paper is unnecessary and can contribute to the deterioration of the roof by holding moisture. Galvanized steel roofing nails were specified, two per shingle, nailed flush with the shingle. The copper flashing was hand made on-site and installed by professional sheet metal workers. Cedar ridge caps covered the exposed flashing on the hip and ridges to give the roof a finished look.

It is important that roofing contractors use craftsmen who are experienced in historic preservation and restoration when replacing or repairing a historic roof. The restoration crew that installed the shingles on Lakeport Plantation house were not knowledgeable about wood shingles and their application. Nail guns were used to apply the wood shingles, and the nails were driven below the surface of the shingles,



The photo at right was taken after the new roof was installed on Lakeport Plantation house. The water laying on the floor is from a leak in the roof above the nursery. This was only one of several leaks.

The photo at right shows the first set of shingles as they are being removed from the roof of Lakeport Plantation house and the second set being installed.



damaging the wood, and cracking the shingles. Nail guns are not recommended for use with wood shingles. As a result, the roof began to leak with the first rainfall. The new roof had to be completely removed and replaced.

The roof should be inspected regularly as a routine maintenance procedure. Be careful not to damage the roof when walking on it. Wearing rubber-soled shoes is advised. Look for any loose or damaged shingles or flashing and make repairs where necessary. Keep the roof clean. Leaves and debris can accumulate in the valley flashing and cause rainwater to back up under the shingles. Check the underside of the roof in the attic for any leaks or damage to the sheathing. Also check the roof for damage after severe weather.

Do not let a leaky roof go unattended. Making repairs as soon as possible is extremely important. If left unattended, moisture will quickly spread to the interior of the house destroying the masonry, woodwork, plaster and paint, threatening the entire structure of the house. With proper care and maintenance a well built roof will protect the house for many years.



The photo at left shows the correct method for installing wood shingles. The shingles should be placed approximately one-half inch apart to allow for the shingles to expand when wet. Using a hammer, the nails should be nailed flush with the shingle to keep from damaging the shingle.

Resources:

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National Park Service, U. S. Department of the Interior. Technical Preservation Services. <http://www.cr.nps.gov/hps/tps/>.

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