

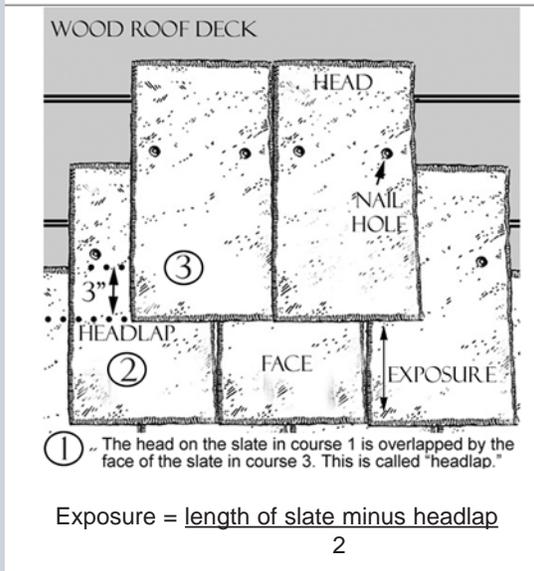
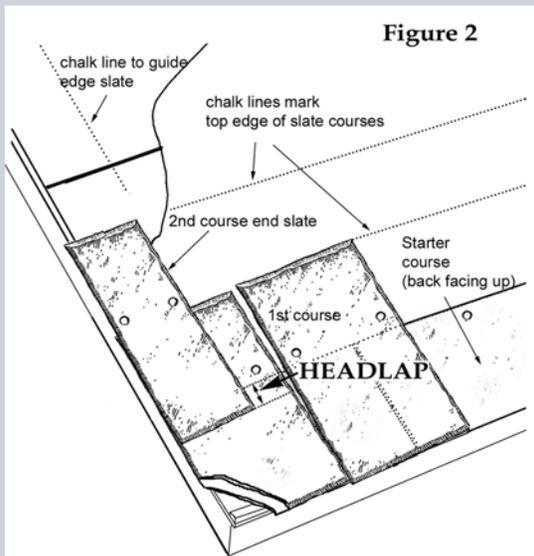
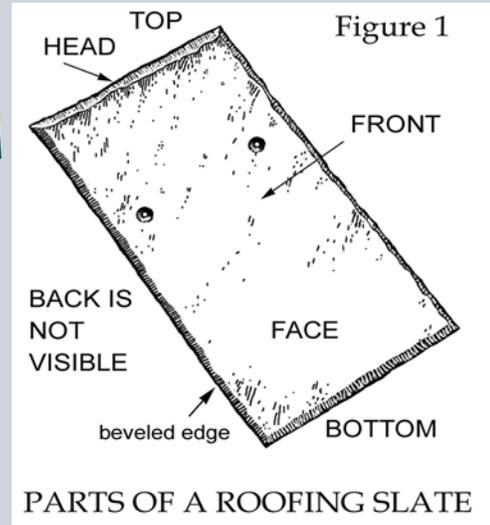
HEADLAP

JOSEPH JENKINS

INSUFFICIENT HEADLAP. ZERO HEADLAP. NEGATIVE HEADLAP. These are all words that should send a chill up the spine of any good slater. There are few details on a slate roof installation that, if done wrong, will cause the entire roof to be condemned and have to be removed and done all over again. Headlap is one of them.

As a slate roof consultant, I have the opportunity to travel the country and look at newly installed slate roofs, many unfortunately riddled with glaring installation mistakes. I always check the headlap first. If the headlap is OK, then the roof installation has hope. If the headlap is missing or inadequate, the roof is doomed.

What exactly is headlap? I'm glad you asked that question. Many contractors will take on a slate roof installation project with little or no experience and, amazingly, will forge ahead with the job without doing any research or attempting to gain any education whatsoever about slate roof installation. This is despite the fact that a couple hours on the internet will yield a wealth of information about slate roofs. Much of that information is available at TraditionalRoofing.com, but there is also much more at SlateRoofCentral.com. So some curiosity is always welcome.



If a contractor doesn't understand the principle of headlap, he or she should not be installing a slate roof until that simple principle is completely digested and absorbed. Let's start with the basics. Every piece of roofing slate has a front and back, top, and bottom, when being used on a standard American style slate roof (Figure 1). The bottom, front (often called the "face") is what you see after the slate has been installed on the roof. The back of every slate faces the roof (except on the starter course, but that's explained in Traditional Roofing #5). The back does not show the beveled edges of the slate nor does it have indented (countersunk) nail holes. The front of every slate faces the sky and shows the beveled edges and indented nail holes. The top of the slate is covered by the overlying slates. The very top of the slate is called the "head." When one slate overlaps another, that's called overlap. Pretty simple. When the head of a slate is overlapped by the slate two courses above it, that's called headlap — that's the critical overlap on a slate roof (Figure 2). Headlap is what keeps the water from penetrating through the roof. Headlap is essentially what renders the roof water-tight. If there is no headlap, the roof will leak.

Standard headlap these days is 3", however, the headlap varies according to slope (Figure 3). When the slope drops, water drains more slowly, so more water-tightness is required. This is achieved by simply increasing the headlap to 4". Slate roofs should not be installed below a slope of 4:12 (4 feet of rise on 12 feet of run). In fact, the best slate roofs are installed on slopes too steep to walk upon (8:12 or above). However, if you must install slate on a lower slope, then from 4:12 up to 6:12, a 4" headlap is recommended. Extra headlap never hurts a roof, so 4" headlap is often recommended up to an 8:12 slope. 8:12 and above can use a 3" headlap, which *can* even be dropped to 2" when the roof is really steep. These are standard industry recommendations today. Having said that, however, there are many slate roofs 100 years old with only 2" of headlap with slopes down to an 8:12. The problem with installing slate with 2" headlap is that the layout of the slate courses requires precision in order to maintain a consistent 2" headlap throughout the field of the roof. If the slates are not installed along a chalk line, the courses can go wavy and you can lose your headlap altogether (Figure 7). Better to install the roof with a 3" or 4" headlap and not worry about cutting corners.

The reason contractors do cut corners with headlap is because it uses less slate. It also reduces the weight of the roof. Neither of these two factors is justification for installing a slate roof with inadequate headlap. Better to err on the side of caution and install a roof with extra headlap, than skimp and risk having to remove the entire roof and start over. Figure 4 shows a roof that was installed with negative headlap. Such a roof is like a sieve, designed to allow water to pass through it. This was a new slate roof on a college dormitory. Figure 5 shows a roof with little or no headlap — another disaster. Headlap is hard, if not impossible, to spot on a roof when looking straight at the field of the roof. However, if you can look at the gable end, the headlap, or lack thereof, is as clear as day (Figure 6).

There are times when extra headlap is valuable. These include when slate is

Continued On Next Page

installed in ice-dam prone areas of the roof, such as along eaves. If ice-damming is a serious consideration on your project, increase the headlap along the eaves by an inch when installing the slate. Extra headlap can also help with wind resistance. The extra overlapping makes for a tighter roof, one less likely for wind to get underneath the slates.

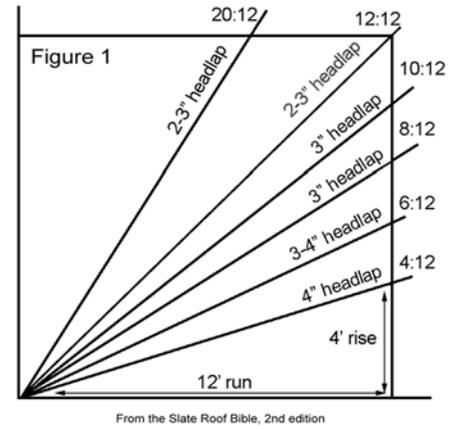
The roof calculations are simple enough. If you subtract the headlap from the length of your slate, then divide the remainder in two, you have your slate exposure or course spacing. For example, a 20" long slate with a 4" headlap would have an 8" course spacing ($20" - 4" = 16"/2 = 8"$). Course spacing, or *exposure*, is what you see of each course on the roof. Typically, a slate roof is installed by chalking the top of each and every slate course, then nailing the slate to the roof along the chalk lines. In the example given above, there would be a chalk line every 8" up the field of the roof. The top, or head, of the slate would align with the chalk line. The second course of slates above would then overlap that head by 4". Voila! Headlap!

Before you run out and start chalking 8" lines up a roof for 20" slates, let me remind you that the starter course, first course, and often second course will be chalked on a different measurement. You can read about starter courses in Traditional Roofing #5.

When ordering slates for a project, you should know your headlap ahead of time and order the slates accordingly. For example, a 10"X20" slate requires 170 slates per square (a "square" is 100 square feet of roof coverage) when installed with a 3" headlap, but requires 180 slates per square when installed with a 4" headlap. Furthermore, you want to make sure the slates are manufactured with the nail holes in the right place. The nails should be installed just above the head of the underlying slate. In the example given above, the nail holes must be a minimum of 12" from the bottom of the slate (8" exposure plus 4" headlap), but 13" would be better because it would give you some extra clearance. If the nail holes are too low, you'll be nailing through the head of the underlying slates, and that's a no-no. I only mention this because you may want to install a slate roof with even more than 4" of headlap on a lower slope situation, so you'll have to watch your nail placement as most slates are manufactured to be installed with up to a 4" headlap.

It's not as confusing as it sounds. Study the illustrations in this article and you will see that headlap is really a simple concept as well as a critical element of a slate roof. You will also find that, once you understand headlap, you can make a roof out of anything that can be made into a flat shingle, not just a piece of stone. Cut the ends off a beer can, cut down one side of the can, flatten out the remaining piece of aluminum, and you have a beer can shingle. Make a bunch of them, install them with correct headlap, and you have a beer can roof! Just think of all that beer you'd have to drink though. Bummer. ☹️

Figure 3
Recommended Roof Slopes for Slate Roofs
(showing minimum headlaps)



One inch headlap on this shopping center roof in Covington, LA, just doesn't quite cut the mustard. This new roof must be removed and reslated. 📏

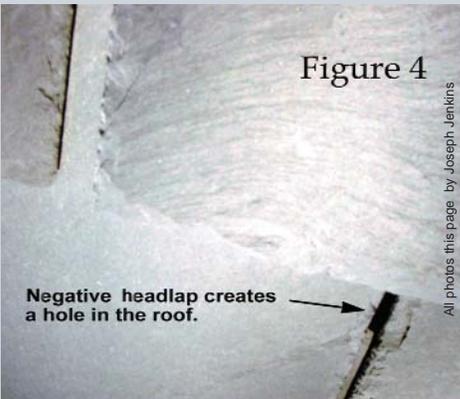


Figure 4

Negative headlap creates a hole in the roof.

All photos this page by Joseph Jenkins



Figure 5

This slate roof was installed with little or no headlap. It will have to be completely removed and reslated. It is a huge roof.



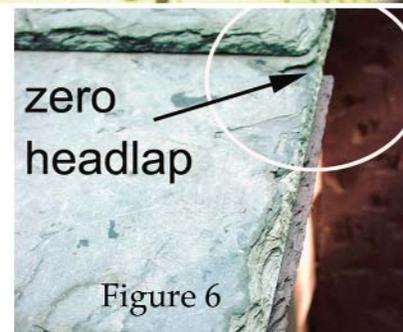
1 1/4" headlap on starter course - a common mistake



Figure 7

EXAMPLES OF HEADLAP ERRORS

Clockwise from top left: F4: An inadequate starter course has created "negative headlap" at the worst place on the roof — near the drip edge where the roof takes the most water. F5: The same starter course, on a college dormitory in Pennsylvania, showing inadequate headlap. Top, right: The problem of inadequate headlap on the starter course is more common that it should be. Here it is shown on a church in Virginia. F6: No headlap at all on the entire roof of this historical building in Georgia cost \$450,000+ to remedy. F7: The wavy nature of the courses on this Louisiana shopping center roof show how headlap can be lost by sagging lines. Install slate along straight, accurate chalk lines for best results.



zero headlap

Figure 6