

11. SLOPED vs FLAT

Mention the word "roof" in Santa Fe and your bound to hear cussing and cursing about leaky flat roofs. The biggest complaint is because their roof is flat and water stands on top this leads to leaking. True enough most roof leaks are caused by inadequate slope, but many times the way a roof is detailed or built by your builder/roofer is the reason your roof is leaking.

First and foremost no roof should ever be flat. The Uniform Building Code requires a minimum slope of 1/4" per foot. The old way to get this slope was by just locating the big end of the viga on the high side of the roof. The problem with this is that you can not guarantee that the slope will be consistent or that water will not pool at flat spots over the vigas. The other option that was commonly used was literally putting dirt on top of the wood decking and raking it to get the slope. This provided slope but did not provide insulation as required by the energy code. This process was replaced by putting pumice on the roof and getting both slope and insulation with the pumice. Once again the slope of the roof could vary (depending on the raking job) and any roof leaks could go undetected because it would be soaked up by the pumice. This form of system is no longer legal in the City of Santa Fe.

The three most effective systems to achieve slope and provide for controlled drainage are tapered insulation systems, a built-up pocket roof or ripped 2 x's on top of roof structures without exposed beams or vigas. The tapered roof insulation is the most expensive system and is a custom roof system that is designed for each application. It provides consistent slope, but because it is custom the price is high. It also does not allow for recessed lights (unless you build boxes at every light location) which is important in beamed ceilings.

The pocket roof is the choice of most residential applications because of its economy and usefulness. This system consists of building 2 x 4 walls and framing on top of the beamed ceiling structure. This creates a pocket (depth depends on the length of the roof) in which regular batt insulation can be put into and recessed lights (with thermal housings) can directly be cut into the ceiling without penetrating the roofing itself.

A variation of this is the third system which you use with 2x joists or truss joists. In these systems you take 2 x 12's and cut them consistently to form the slope. You then simply nail them to the tops of the 2 x or Joist and you have your slope built-in. The batt insulation and lights can be installed in the voids

between the roof structure. The last two systems are what we typically use, but there are some details that are common to all three systems that I'd like to discuss further.

The parapet will make or break a roofing system. If the parapet is not high enough (must be 16" to 24" above the roof) snow and/or water will collect against it and cause damage. Just driving around town you can see what happens if a parapet is too low, the stucco cracks and breaks off and probably the roof leaks along the parapet. Two other items to keep in mind when building parapets are 1) the roofing should go over the top of the parapet about 12" to protect the parapet from moisture and 2) slope the top of the parapet towards the back not towards the front. By sloping the parapets towards the roof you insure that the front wall will not be stained by water draining off the parapets and that the stucco will not crack at the tops of the parapet which can lead to water infiltrating into the walls below.

Another problem that must be addressed when doing the parapets is insuring water does not drain against the parapets. This is achieved by installing 4" cant strips on the high side of the roof, the parapets parallel with the sloped roof and providing crickets on the parapet on the canale side. A cant strip is a 4" x 4" triangular piece of wood or fiber that keeps water from traveling along the side of the parapet. A cricket is actually a sloped surface that diverts the water towards the canale and away from the parapet, a cricket usually projects 6" - 12" from the face of a parapet. Crickets are also important on the high side of skylights or mechanical equipment to deflect the water.

Canales are also a natural weak point in every roof. They are where all the water has to travel through to exit the roof and thus must be installed correctly or they will leak. The roofing must extend almost to the end of the canale and up the sides of the parapet a minimum of 12". The canales must also be designed to drain the right amount of roof area. Canales can drain 1000 square foot of roof area, often you will see 4 or 5 canales draining only 1000 square feet, when one canale would be adequate and also reduce your chance of leaks at the most common roofing connection failure point. I prefer to use copper lining in canales on my jobs, this adds another level of security and added life to the canale.