

MILLION DOLLAR PROBLEMS

We recently received a phone call from a homeowner about mold problems at their property. The house is under 2 years old and has a value of \$1,000,000. We listen to the homeowner for a few minutes and begin to finish the homeowner's statements. Some people might think that a million dollar house has been constructed better than a \$200,000 house and that there will be no problems. We've found that because of the complexities of million dollar homes, combined with the limited forethought and follow-through of designers and contractors; most million dollar homes have many more problems than the standard \$200,000 residence.

The following case history is typical of those million dollar problems that have been examined by Daniel C. Smith PE Consulting Engineers (DCSPE) all across North Carolina and several bordering states.

BACKGROUND OF SUBJECT STRUCTURE CONDITONS:

The affected home is three stories, including a full basement. The roof has several gables and hips so that water discharges into long gutters with only one or two downspouts for each gutter run. Water seems to collect around the foundation wall on all sides. Since the soil in this area is clay, soil drainage tends to be a problem. The presence of a large deck along the rear doesn't assist in allowing the ground to dry out. In this case, there are outdoor steps that are open above (no roof) so rainwater sheers down all the perimeter walls around the steps as well as down the steps themselves. This may not sound bad until you realize that three stories of water drain down the walls and there are about 14 steps downward to the basement entrance. This is like a small swimming pool with only a catch basin type drain installed at the base of the steps to handle the water.

Since this was never done, the water that has affected this location has bled through the exterior brick and masonry so that the framing lumber in the near vicinity was found to contain elevated moisture levels. This is why there was mold growing on the baseboard molding and one of the reasons why we were called. Just removing the baseboard molding and replacing the affected materials doesn't correct the reason why water gets there in the first place.

GENERAL CONTRACTOR INVOLVEMENT:

The homeowner became frustrated with the drainage problems and contacted the general contractor on numerous occasions. The contractor reportedly visited the property on several occasions and even brought their engineer to the site to determine what the cause of the problems were. In an effort to get answers, the owner called DCSPE.

BASEMENT CONDITIONS FOR 2 YEAR OLD HOUSE:

DCSPE noted that there are several sump pumps located in service areas around the basement. The basement walls were concrete precast walls and there was no efflorescence to indicate that exterior moisture is getting into the basement. This indicated that there must be a decent moisture application on the exterior side of the basement walls. Then the homeowner states that one of the sump pumps runs continuously.

WHY DOES MY SUMP PUMP RUN CONTINUOUSLY?

DCSPE evaluated the sump pumps only to discover that there was a screw hole in the side of the 2" PVC pipe leading from the sump pump to the discharge location. This hole sprayed water as soon as the pump turns ON. This condition saturated the wall insulation on the side of the theater room. Most of the water pumped up the pipe flowed back into the pump pit, providing a continuous loop of water. The remaining water affected the theater room walls.

MOLD, MOLD EVERYWHERE....WHAT'S GOING ON HERE?

The first puzzle involves an interior theater room in the basement that has significant mold growing all along the baseboard of this enclosed room. Moisture readings indicate that the lower wall materials were 90% wet and most walls show complete saturation readings. The aroma is undeniable and this condition has likely existed for some time.

Over time, this hole in the sump pump pipe has provided the water source for the mold and water damage that has affected the lower walls in the theater room. All this because a screw hole in a PVC pipe was never repaired.

The worst location of mold growth involved a basement exterior wall on the driveway side of the structure. The wall materials were noted to contain elevated moisture and the carpet was damp. DCSPE used a thermal image camera and was able to see the temperature difference in the wet walls in contrast to the dry wall materials adjacent to wet areas.

Only with the thermal image camera were we able to locate the source of the water. The repair costs were greatly reduced because the source of water exposure could be precisely identified over a 90 foot length of wall.

A little excavation of the soil adjacent to this wall revealed that the exterior moisture barrier was not properly applied, which allowed the water in the adjacent soil to bleed through the wall and drain into the framing cavities.

REPAIR RECOMMENDATIONS IN THIS CASE:

Our recommendations in this case involved fixing the damaged PVC pipe; additional construction and water seal coating at the exterior basement steps; and completely removing materials in the basement room in order to get a better idea of where the moisture is coming from. We specified in our report that additional work along the exterior will be required to prevent moisture from affecting this wall.

AN EXPERT PERSPECTIVE REQUIRES A KNOWLEDGEABLE EXPERT:

There are many engineering firms that can evaluate property conditions. However, DCSPE has experience in both design (structural engineers) AND forensic evaluations. By having extensive experience in building design, forensic evaluations and fungal growth (mold) evaluations, we were able to determine the causes and remedies for problems that had not been able to be solved by other experts, including the general contractor and their engineer.