

3. BUILDING EXTERIOR:

Description:

This chapter includes information on the outside of the building including roofs and the bell tower. Most of the issues involve moisture problems or appearance and they will be discussed separately. This chapter is longer than any of the others because the problems have been more complex, long lasting, and expensive than any others.

Roofs

The tile roof on the sanctuary was replaced about 1990. Under the tile are furring strips that are on a solid wood roof that is covered with tar paper and at least two strips of ice shield near the eaves. The tiles originally used on this project leaked and had to be replaced within a year with a more impervious tiles.

Around the year 2000 leaking problems developed around the bell tower. A-1 Roofing of Bend was hired to remove the tiles in the valley on the south side of the bell tower and along the east side as well. A thick waterproof membrane, similar to what is used on flat roofs, was extended up several feet on the side of the bell tower and extended about ten feet out from the tower, creating a seamless waterproof barrier between the roof and the tower. The tiles were then replaced. This seemed to eliminate most of the leaks.

The flat roof on the education wing was replaced before the 1996-97 remodel so that section was not replaced as a part of the construction project. However, shortly after the remodeling project it was replaced by Sam Brown Roofing. Almost immediately after the new roof was installed leaks started occurring around the roof drains. They tried several times to solve the problem but were never totally successful. The company left Bend about 2009, shortly after the recession. After they left town AM-1 Roofing repaired the membrane several times and also extended it from the flat roof up the west wall and under the tile roof to prevent any moisture from coming down the wall and getting under the flat roof. In 2013 it was determined that the existing roof could no longer be repaired and the old roof was removed and a new composition roof was installed by High Desert Roofing. It was determined that there was no damage to the wooden roof underneath. Also, at this time the kitchen air handler unit (the big red unit) was lifted up and placed on a pedestal, like all the heating units, so the roofing would make a better seal around that unit.

There are six roof drains for the water that collects on the roof (See chapter on roof and stairwell drains). These drains have to be partially removed and then reinstalled after the new roofing material is laid down. These drains have continued to leak despite continued efforts to repair them and the problem is not completely solved.

The original 1996-97 gym roof was of composition singles. When A-1 Roofing was inspecting the education wing roof they noticed that the gym roof had a type of singles that had been determined to be defective and needed to be replaced. The church would have been eligible for a cost adjustment except the roof had not been installed properly. The roof had been vented, which is proper if there is cold air below. However, the attic below has warm air because it contains a charged fire sprinkling system that must be kept from freezing. Therefore the attic should not have been vented. The new roof was not vented and a large vent in the east gable end, approximately three feet in diameter, was blocked off so the church didn't lose heat.

In 2012, A-1 Roofing removed the composition singles on the roof and installed a metal roof and there have been no leakage problems. When the solar collectors were installed they used a type of fasteners that supposedly did not penetrate the metal roof.

There are also roof drains associated with this roof that are described in the chapter on Roof and Stairwell Drains.

Bell Tower

The bell tower has had a perpetual problem with leaks. The window openings were originally fitted with wood louvers that were open to the weather and the tower had a tin floor. This allowed the rain to come in as well as the pigeons. The flat roof had a cast iron drain pipe that went down through the building and into the sewer system or a storm drain. At some point before 1980 the louvers were removed and plywood panels were placed over the windows on the inside. The roof drain was also changed at some point, possibly when the roof was removed to remove the bell, and replaced with a small, approximately 2 inch by 2 inch drain pipe that went down through the tower and empties out onto the roof. This pipe was replaced with a 4 inch plastic pipe in Dec 2017. There is additional information in Section 13, Roof and Stairwell Drains.

The bell tower is exposed to the extremes of central Oregon weather; high winds and driving rain in the winter and hot, sun baked conditions, in the summer. The exterior is a combination of wooded boards and concrete panels that are painted white. The wood is nearly 100 years old and full of cracks and checks, which provides many places for moisture to enter. Moisture can also get in where the wood siding butts up against the concrete panels, windows, or other decorative features. The windows also have large flat windowsills that allow water to collect and seep into the building. The best solution so far is a good caulking job every 5-10 years. It was re-caulked and repainted in 2017.

The flat roof on the tower is several feet lower than the exterior walls and it is covered with a flat roof membrane material that has a silver reflective coating. In 2017, it was determined that most of the silver coating has worn off and the plan is to replace/repair it in 2018 even though there are no indications that it is leaking. The sheet metal cap on the tower walls is also loose in places and need some minor maintenance.

Moisture problems in the sanctuary walls

The church is constructed on top of a rock and concrete footing, which is about three feet below grade on the west side and probably about the same on the other sides. Above the footing is a brick foundation that is at least three brick wide and extends to about 5-6 feet above grade. The foundation is covered with a plaster material. Above the foundation is a horizontal white band or lentil, of concrete about 5 inches wide that extends around the entire building. The stud walls of 2" x 8" material sit on the lentil and they extend up to the roof. The stud walls are covered with wood siding, then a layer of tarpaper, and then with at least two layers of brick. The sanctuary also has several pilasters on each side that give the appearance of columns or buttresses but they are hollow and only an ornamental feature.

The plaster that covers the walls and pilasters below the lentils has been cracking, falling off, and has been patched many times in the past. When this material was removed from part of one of the pilasters in the spring of 2017 some of the bricks were found to have deteriorated enough that they had to be replaced before the wall could be repaired. Inside the hollow pilaster were pieces of wood that had been used as framing material for the lentil. They were so wet that water could be squeezed out like a sponge. Obviously water is getting into the pilasters and the walls and when it can't get out is cracking the plaster and pushing it away from the bricks. This

same problem is seen on the inside of the building where the paint won't stay on the walls in the Fellowship Hall below the windows and there is some deterioration of the concrete walls. The wainscoting in this room was installed about 2001 simply to hide this problem.

One contractor, Pioneer Waterproofing, from Portland has recommended removing the plaster from the foundation walls, replacing any deteriorated bricks, and then covering it with a breathable plaster and paint-like breathable mineral coating. Several test areas were done in the spring of 2017 and future actions will depend on how well they hold up. Unfortunately, it may take many years to figure if that is the correct solution.

Other solutions may include inserting vents in the pilasters so they will dry out, repairing the pilaster caps so no moisture can enter from above, searching for other entry points for moisture, or treating the bricks with a waterproof material. This last item is controversial because the same sealants that keep moisture from getting into the building can also keep moisture from getting out of the building, which can damage the bricks. Another contractor tested the porosity of the bricks above the lentil and they did not adsorb any moisture.

In the early 2000's there was a problem with paint peeling off the wall next to the stairway leading to the sanctuary from downstairs. The exterior wall was excavated down to the bottom of the footing and a waterproof membrane was placed over the foundation from the footing to ground level. A four inch flexible perforated pipe was placed in front of the footing and connected to a drain on the south side of the building. The plaster on the west wall was also repaired at that time. This seems to have helped with the paint problem on the inside. One thing that still needs to be done is to install what is called a termination bar on the membrane so that water can't get behind it.

MAINTENANCE:

Roofs:

The tile roof needs to be inspected every few years to repair or replace tiles that become broken or slide out of place. The flat roof on the bell tower probably needs to be replaced now. The leaking problem around the roof drains on the education roof need to be resolved. The metal roof should last a long time unless there is some storm damage.

Bell tower:

Other than a complete rebuild of the tower, the consensus from several experts is to simply do a good job of caulking every few years. The roof drain in the tower is the only drain that is not protected by heat tape, which is something that should be considered when the roof and drain are replaced.

Moisture problems in foundation walls:

Knowing what actions to take is still a work in progress. Some questions have been answered but others remain. What is known, for example, is that moisture is getting into walls below the lentil and that is probably what is causing the plaster to crack and pull away from the building. This is probably responsible for the paint coming off the wall in the fellowship hall.

What has not been determined is how the moisture is getting into the wall below the lentil. Is it coming from the bricks above, through the ground, through the cracked and broken plaster, through some other means, or from a combination of sources?

Some tests have been made using new breathable plaster and paint like coverings but it may be a long time before definitive results are known. It may be necessary to precede with some maintenance actions without all the information in hand.

Piezometer Well:

There is an 8 -10 foot vertical section of 6 inch plastic pipe with a white cap located next to the building just east of the parking lot entrance. The pipe was installed during construction to see if water is collecting along the foundation. This was in an area of solid rock that required difficult excavation and little or no water was expected and none has been detected in the past. To check, simply remove the cap and drop a rod or board down to the bottom of the well to see if there is any water. The best time to test would be after a period of heavy rain.