St. Mary's Bell Tower and Steeple Repair Update

As most parishioners are aware St. Mary's church has water damage. The parish Buildings and Grounds Committee have been and continue to work on addressing these issues.

Recently, additional water damage was occurring around the church bell tower and steeple. Based on input from parishioners and local contractors that investigated the bell tower and steeple conditions and in consultation with the diocese an engineering company was hired to assist with addressing the issue.

Jim Tometich, P.E. with Tometich Engineering, Inc. was asked to investigate the cause and assess the extent of the damage to the bell tower and steeple and provide advice on repairs. Jim provided his report on April 23, 2022.

Below is the evaluation and assessment provided by Tometich Engineering Inc. The Buildings and Grounds Committee has reviewed this report and is working to investigate repair options. The committee will continue providing information to the parishioners of St. Mary's – Holy Cross on repair options as they are developed. For additional information on this issue please contact John Roberts (jroberts@huxcomm.net), Co-Chair of the Buildings and Grounds Committee.

Tometich Engineering Evaluation and Assessment:

The bell tower is the focus of this report. The tower has had water infiltration for years. The water has damaged the masonry and the wood framing. The wood has failed in the southeast corner and needs repaired. The internal structure in this area has dropped about 2". Although the masonry has not failed (just the internal wood), the masonry needs repaired as well.

The masonry has two elements, the mortar and the tile and brick. The interior masonry is in poor condition and is turning to powder in many areas. Many of the joints are totally missing their mortar. The mortar is the glue that sticks the tile together making it a structure. Thus, the mortar needs replaced. This procedure is called tuck pointing, it needs to be done on the interior of the tower. If not, the mortar will continue to fail and eventually will lose its structural stability. Similarly, the tile has been absorbing water and going through the freeze thaw cycle. Just like the mortar, it absorbs water, freezes and deteriorates. This can be seen in the many tile that are missing their faces and thus their structural integrity is compromised. The tile can be repaired by grouting the broken cell full of mortar.

As opposed to tuck pointing, another method is to simply apply a cement coat to the whole area. This procedure (back plastering) applies a scratch coat of mortar into a wire mesh. Then a final coat of mortar is applied over the area.

The next area of concern is the wood elements in the bell tower. The wood presently is not treated wood and thus it is rotted. The wood needs to be replaced. The wood elements that have failed need to be removed and restructured (lifted) into their original position. Once in the proper position, the wood needs to be secured into the masonry. This is done by grouting a tile cell full of mortar and attaching and epoxied anchor (once the mortar is cured). The difficult part of the problem is to lift the structure, there are very few solid places to work from.

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The original problem is water infiltration. Currently, the rood water is collected in an internal roof drain, the brought through the upper roof into the bell tower area. It is then discharge through the wall on the west face of the bell tower. The problem with this is that the water goes through freeze thaw cycles inside the bell tower. This causes leaks. A review of the discharge pipe show numerous area of problems. It is my opinion that this water should be re-routed and discharged from the roof of the bell tower and not through the inside. This would require modifying the appearance of the roof of the bell tower.

All of the above being said, there may be some benefit to re-evaluating the bell tower roof structure. The repair of the structure as is will be very time consuming and expensive. It may be wise to consider removing the roof of the bell tower and replacing it with a roof the cover the entire structure and has an overhang. Basically a new “hat” for the bell tower. This would allow the water to discharge off of the roof and fall to the ground or adjacent roof structure. It could also be collected in an external gutter and discharge on the west side of the roof. Another solution would be a flat roof that has a scupper that discharges the water to the west.

Conclusions:

Based on the results of our investigation, the following conclusions would appear to be warranted.

1. The bell tower has leaked for years and the masonry structure and the wood structure are compromised and failing.

2. The tower needs repaired or rebuilt in the near future, the problems will only get worse and more expensive if nothing is done.