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INTRODUCTION

***** Property Management contacted me about problems with spalling bricks and failing brick window sills. Bob ***** and I walked the roof and the perimeter of the building. We also reviewed the brick sills from inside an empty unit. This Assessment intends to provide an analysis of the conditions, an approach to the repairs, and a budget. While initial conversations included window restoration work, I understand that that aspect of the work is on hold.

I have spoken with ***** at the City Historic Preservation office regarding this project and her opinions are included in this assessment.

Three of us with experience in these masonry projects have visited the site and helped develop this assessment.

SUMMARY

The normal life of the masonry has reached a major maintenance point. Two of the design features of the building – parapet walls and rowlock brick sills – have probably contributed to a somewhat shorter life, only 60 years. Damage needs to be repaired, and these two design features need to be maintained or altered as much as possible to prolong the life of the building masonry.

PART 1 - ASSESSMENT

Damage

Broken wall bricks are visible mostly on the south side, and near the top. Some areas, as above the upper deck, are extensive and visible. Other areas, as toward the east behind the tree, are spotty and difficult to see from casual observation. I estimate that there are 300 damaged wall bricks on the building, usually in small clusters.



I estimate that there are between 30 and 50 damaged window sills. Some are entirely damaged, while others have only one damaged brick. This is also more prevalent on the south side.



There is one location on the south wall at the top where an area of bricks has shifted. Many of the parapet cap joints are open, and some of the caps have moved or shifted.

There are some significant vertical cracks in some locations. These usually indicate structural problems such as movement or stress from rusting steel window headers.



Analysis

The bricks are breaking apart in a manner called “spalling”. Spalling is



caused by moisture in the brick creating hydraulic pressure as it tries to leave, or by the moisture freezing. Ideally, the mortar between the bricks acts as a matrix to help channel the moisture away from the brick. Mortar varies in strength, and harder mortars tend to not wick moisture very well. If a hard mortar is combined with a softer brick, spalling can become chronic in the right conditions, which is what I believe is happening on the *****: hard mortar, soft bricks, too much moisture. The remedy is to eliminate as many of these factors as possible.

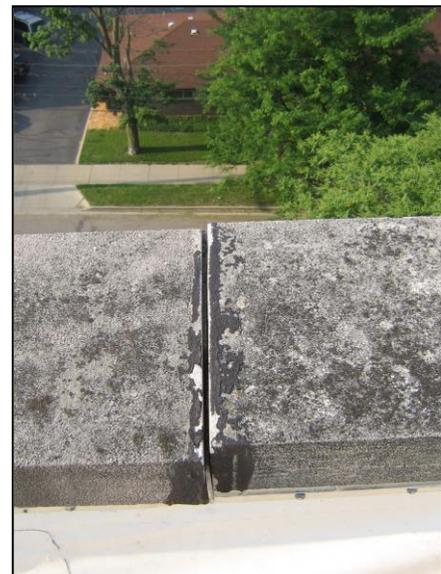
The design of this building permits rain and snow to penetrate into the masonry more than other designs. Parapet caps are notorious for accelerating masonry damage as they tend to let water in easily at the cap joints. The rowlock brick window sills allow water to percolate down through the mortar joints.

Remedies

There are no comprehensive remedies for two of the factors: hard mortar and soft bricks. However, during repairs, a softer mortar should be used for all future work.

Regarding the control of moisture, it would be possible to improve the design of the parapet cap by adding a continuous metal cap to it. This will cover all of the cap head joints which are now open to the sky, so they would no longer need maintenance. However, given how accessible this area is, it would be more economical to simply keep an eye on these joints and keep them sealed.

For the window sills, these could be covered with metal. The metal could be a zinc-coated copper, which would require no maintenance, is neutral in appearance, and would not stain the brick below. It would also be essentially invisible from the ground and very likely to be approved by the Historic Preservation Commission.



Waterproofing or water repellants are suitable on some structures. These are a “last ditch” solution in some situations, once all others have been tried. These products are discouraged by the Department of Interior Preservation Standards, which is the standard we use. Our experience with these products has been limited to attempting to repair buildings where these materials have been applied and failed. Firms who apply these coatings commercially will disagree with the Preservation Standards.

Repairs

Repairs to the spalling wall bricks involves grinding out the broken bricks and replacing them using new bricks and a softer mortar. This is simple work, requiring only special attention to new brick selection and appearance, and enforcing the use of the correct mortar.

Repairs to the parapet cap should involve removing and resetting 3-5 stones. All of the joints should be cleaned out, primed, backed and caulked.

The window sills present three options:

1. Rebuild damaged sills with new brick and softer mortar. This will repair the damage, but not prevent future damage to repaired or unrepaired areas, which can be expected.

2. Replace all of the brick sills with limestone or cast stone (concrete). This eliminates almost all of the sill joints (there would still be some), and would alter the appearance of the building. According to the Historic Preservation staff, this change would need to be approved by the Commission; using brick-colored cast stone would make it easier to get approval.

3. Rebuild damaged sills with new brick, then cover all sills with metal. This repair would almost certainly prevent any future damage, and would be approved by Historic Preservation staff. There may be an already-broken brick or two that could still fall after the metal was installed. The bricks would be inspected before the installation of the metal, but there couldn't be a guarantee.

The vines need to be removed to do a thorough job as they may be covering damaged areas.

We considered three different access methods: swing stage (walkway hung on cables), aerial lift, and scaffolding. We concluded that the additional costs of fully scaffolding would be more than off-set by the costs of moving and manipulating either a lift or a swing stage. While it seems to be "overkill" to fully scaffold an elevation, once it is set up, the actual work can be done significantly more quickly, efficiently and safely.

PART 2 – BUDGET

Here are some budget amounts *based on the scope as defined on the aerial photograph*. It would include all of the approximately 180 window sills on all elevation. These are only budget amounts and are not firm prices or a proposal to do the work.

OPTION ONE: Set scaffolding, replace 30-50 damaged brick sills with bricks, repair all broken wall bricks: \$115,000

OPTION TWO As above, but add metal to all sills: \$35,000

OPTION THREE Set scaffolding, replace all brick sills (damaged or not) with limestone or colored pre-cast sills, repair all broken wall bricks: \$205,000

OPTION FIVE Reset 5 parapet cap stones, recaulk all cap head joints, rebuild one damaged section: \$15,000

PART 3 – RECOMMENDATIONS and NEXT STEPS

We recommend choosing the worst elevation (one wall and maybe a dozen windows), developing firm specifications, and completing that limited scope of work. After that, you could have a better feel for what the other elevations would cost, what unknown issues have come up, what works, etc. The prices in Part 2 are meant for long-term budgeting to address the entire problem. Practically, the repairs should be done in sections.

Given the access costs, I do not recommend repairing the brick sills without replacing the entire sill. The undamaged bricks on a damaged sill will soon fail.

Undamaged sills should be covered with metal. Sills that appear sound should be carefully examined by a competent mason to determine if they are loose or have unseen damage. Any marginal sill should be rebuilt. A truly sound sill can be left, and covered with metal.

Covering the sills is a precise task for an experienced sheet metal worker, as a missed or poorly done detail can ruin the work. The joints must be soldered, the right kind of fastener must be properly installed, the details of the caulked window frame transition must be precise, and so on.

Attempts to spot repair the parapet cap joints will not work. They need to be carefully and completely cleaned and recaulked by a professional, then monitored for maintenance.

We could help you select the initial elevation to complete and provide the specifications for you to get bids, for the fee of \$500 as proposed earlier.