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Nationwide Collections Preservation and Treatment

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Notes from a Brief Preliminary Examination of Trinity Church, Holderness

Marc Williams, President of American Conservation Consortium, stopped briefly to examine Trinity Church on his way back to Concord from personal business further north. He met with Barry Borella, and was able to briefly examine the interior as well as the exterior of the building. The purpose of the examination was to preliminarily evaluate moisture control needs at the Church. This visit does not constitute a thorough evaluation, and observations and suggestions herein are subject to change upon more thorough study.

It is clear the church has a moisture intrusion problem. This can be seen in the form of peeling exterior paint on the clapboard siding, the presence of what appear to be carpenter ants, powder post beetle activity in the framing timbers, and the smell of mildew on the interior. The most severely impacted areas are the framing of the floor and the lower portions of the exterior walls. Impact lessens on the upper portions of the building, but is still present.

The primary sources of moisture intrusion are the following, in roughly priority order.

1. Roof water and ground run-off along the north wall, which enters the crawl space due to damming of the earth creating a ponding effect. However, water intrudes the crawl space on other sides as well. This could be on the order of 500-100 gallons of water for a moderate rain storm, and in the thousands of gallons for a very heavy rain storm. The lack of gutters also causes splash-back on the lower walls, where water hitting the ground with force causes wetting of the clapboards. Several areas of rotted clap boards due to this were noted. In general, slope of the site topography is toward the building in many areas, and water is trapped against the foundation along the entire north side, including the entrance vestibule, with no method of escape.

2. Peeling paint, which exposes clapboards that absorb water and pass it to the interior of the walls and the building.

3. Many of the window bottoms are open about 1/4." This can lead to water splashing into the interior during windy rainy conditions.

4. The roof, which is just about at the point of deterioration that leaking of a severe nature is likely to begin shortly.

5. The outdoor air. At this point, infiltration of liquid water into the crawl space is overwhelming moisture naturally in the air.

Correction of moisture infiltration must be done is a holistically-planned manner. Otherwise, unnecessary activities may be undertaken, or procedures may be implemented that exacerbate rather than improve the situation. Steps to moisture correction follow, in roughly priority order.

A. Formulate a moisture control plan that looks at all of the problems and formulates an integrated series of solutions that can be done in incremental steps.

B. Install gutters on the of all roof drip edges on both the north and south sides of the building. Discharge the gutters on the west end only. Connect the leaders (downspouts) to pipes and extend the discharge all the way to the driveway edge. This can be a temporary installation of inexpensive plastic gutters with discharge pipe run on top of the ground, or can be a more historically-accurate design with discharge pipes buried beneath the ground and emerging at the edge of the driveway (All ground disruption must be preceded by proper archaeological oversight). Gutters can be mounted sufficiently low on the facia board (their tops below the pitch of the roof) so that snow will not damage them.

C. Begin interior environmental monitoring. This establishes a baseline and allows evaluation of the effectiveness of improvements.

D. Re-grade the site so that water running from other parts of the site towards the building is intercepted and directed away from it. Primarily, this will consist of a series of swales on the north and east sides. The north swale should continue all the way to the driveway. The east swale should continue toward the driveway far enough that the discharge continues to run away from the building. Relatively minor grading is required on the west side and south side to slope all surfaces near the building away from it, with an outlet for water to run at least 15 feet from the building, ideally catching a slope away from it.

E. Paint the exterior of the building. Paint failure currently is exacerbated by the moisture. However, improper preparation during previous re-paintings is the reason for failure. Several types of problems were noticed. On clapboards that were previously painted, the newest paint has stuck very well to the older paint. However, the older paint is brittle and has pulled away from the wood. Any future repaintings will suffer the same fate. All of this older paint should be scraped to the bare wood on all surfaces. This must be done carefully by hand - not with power scrapers, pressure washers, or power sanders. Where historic, or possibly original, paint exists, be sure to properly evaluate the paint history of the building. This is generally done with microscopic paint cross-sections. Scraping for repainting will destroy this evidence, so it must be done as part of the next repainting. The second concern is paint on newer clapboards. These clapboards are planed in power planers as part of the manufacturing process. The planers have cylindrical heads rotating at high speeds. These burnish the surface of the wood and make it difficult for paints to adhere to the wood. Sanding these surfaces prior to repainting will allow the paint to bond more effectively. The grit must be sufficiently fine that visible scratches are not formed. It is also advisable to sand the areas that were scraped of older paint to remove the dust from that paint. Write up exact painting specifications before bidding the project.

F. Eliminate the gap beneath many of the windows.

G. Vent the attic space. The current gable end vents appear to be too small. Alternatives include larger gable end vents or ridge and soffit vents. Historic appearance considerations must be weighed in determining a solution.

H. Install room darkening shades on all the window interiors. Keep these drawn whenever the building is not in use. This will keep the interior cooler and will prevent light damage to the interior architectural features.

I. Weather strip windows and doors.

J. At this point, consider if improvements are adequate or if further efforts are needed to control moisture in the exterior air. If needed, install a commercial dehumidifier with a drain tied to the building exterior. Utilize automatic switching controls so that it will run only when the temperature is above its effective lower temperature limit.

K. If needed, install storm windows, either on the exterior or the interior, to tighten the building envelope and reduce moisture exchange with the exterior air.

L. Continue with environmental monitoring to be sure that improvements are working effectively.

The preceding items are the general needs of Trinity Church to control moisture. Please also see the attachment "Moisture Management Plan - General" included with these notes, as well as American Conservation Consortium's web page on Moisture Control for more information.

http://www.conservator.com/moisture_management_services.htm#Moisture%20Management%20and%20Control%20Plan

Or, visit our website **http://www.conservator.com** and click on "moisture management" on the left side of the page.

American Conservation Consortium would be pleased to write a Moisture Control Plan, design specifications for bidding, and manage implementation contractors to be sure that the desired effects are being achieved. Please contact us if we can be of further assistance.