NEW YORK CITY SCHOOL
CONSTRUCTION AUTHORITY

ARCHITECTURE & ENGINEERING

MEMORANDUM

TO: Kenneth Karpel, A.I.A.

THROUGH: Timothy Ng, A.I.A.

FROM: George Roussey, P.E.

DATE: May 17, 2001

SUBJECT: PS 109-Manhattan
Building Protection
Design No. D6140
Terra-Cotta Dormer Concerns

As per your request, the need to remove the terra-cotta dormers was reevaluated due to the letter from the Cabrera Group, an Architectural firm that appears to have been engaged by The Coalition to Save P.S. 109. The letter questioned the need for the removal, stating the terra-cotta work of the remaining dormers appears stable and good and that the individual T.C. "features have not deteriorated to any great extent over the past century."

Due to the potential time lapse between the mothballing of the building and the restoration of the building, it was determined that the current condition of the terra-cotta dormers was such that they could not be left as is. Many of the dormer units were observed close-up on January 18, 2001, and during the week of January 8, 2001, as well as during the scoping of an exterior modernization project in 1995. While the condition of many of the individual pieces of terra-cotta can be considered fair, there are also a substantial number of units that were in poor condition or more importantly created an unstable condition in the dormers. Thus the issue is one of overall stability rather than the condition of the individual units. It was our engineering judgement that the temporary removal and storage of the terra-cotta was the most effective method to prevent further deterioration and safeguard the welfare of the general public from a dormer collapse. Mr. Carl Stein of Stein, White, Nelligan, Architects, our preservation specialist who accompanied the inspection team to observe close-up the conditions of the roof, dormers and building interior, concurs with this approach.

As you may be aware, PS 109 suffered a gable collapse in 1988, which led the Board to authorize a structural investigation. In the original Structural Engineering Integrity Report dated March of 1989 prepared by Severud-Szegezdy Associates, Severud observed that the steel verticals in the spires had rusted at the lower end where the terra-cotta had broken away. They felt certain that the damage to the terra-cotta was a result of rusting of the vertical steel frame, and that the rusting process started at the base and was working its way up the struts of the dormers. In the report they recommended structural repair to the building in two phases. The first phase was to remove the masonry of the fifth floor to relieve loads on the spandrel beams so that a decision could be made as to how to repair them in Phase 2. As part of the phase 1 work, they specifically recommended removal of the dormers, repair/replacement of the steel, and reconstruction.

The Landmarks Conservancy commissioned a later engineering report on the existing conditions of PS 109. The report, prepared by Robert Silman Associates, P.C., dated July 16, 1999, outlines the recommendation for a scope of work for "removal of all façade masonry and terra-cotta at the roof, fifth and fourth floors." The report states that it was necessary to fabricate new units to supplement for the lost or broken terra-cotta units. This report is also in-line with our present course of work. Detailed recommendation drawings were included in this report.

Our findings based on the recent building inspections of January and May are that the terra cotta units are cracked and displaced at many locations and steel can be seen rusting at the base. The tops of several dormers are leaning, with joints much wider than when the building was constructed. These can be seen in the attached photos.

Our experience with several schools of exact or similar design all showed that the steel behind the dormers required repair and was the major cause for the dormer failures. The schools, PS 33 X, PS165-M and PS171-M, have the same dormer terra-cotta ornamentation and these buildings exhibited very similar structural/ architectural deterioration patterns and failures. With the failure of the steel supports at these schools, the terra-cotta units at the bases of the dormer were the first units to deteriorate, due to the dead load acting upon it from the terra-cotta units above as well as the proximity of the steel to the face. The removal of all the dormers and their replacement proved to be the successful restoration effort undertaken at these schools. Replication of damaged units from molds helped assure a smooth construction process and a successful restoration.

By removing the terra-cotta at PS 109-M now, pieces that are still in fair condition will be prevented from further damage due to water penetration and the continued rusting of the steel. An adequate, in-place, stabilization scheme was not envisioned,

since it would have required an extensive in-place repair and replacement and anchorage for work that would have to ultimately be removed because of the underlying structural deterioration. The Coalition's Architect stated in his letter that the work required would only be caulking the open joints and anchoring back the loose pieces. This comment would not be an adequate solution and cannot be endorsed.

Allen Sieger, the Project Architect, reaffirmed the condition on May 14, 2001, and also contacted Carl Stein, who assisted in the document review and mothballing procedure. Mr. Stein is in agreement that the terra cotta is in poor condition, based on his personal inspection of January 2001, and that it should be removed at this juncture and not wait until a restoration is planned.

We do not believe that an additional independent assessment of the terra-cotta is warranted, as we have already inspected the conditions several times and as the engineers responsible for the design, we believe it is the correct and safe solution. Any in-place stabilization and partial removal would incur unnecessary costs since removal can be readily accomplished and all terra-cotta units would have to be removed eventually for the steel repairs and resetting, when the replacement units are installed.

Attach: Memo from the Cabrera Group dated May 9.
Photograph of typical dormer condition (Two pages)

Cc: Peter Sweeney
Tim Ng
Parmesh Nizambad
Allen Sieger
Carl Stein (Stein, White, Nelligan)
Project file (B6140)