OLD STRUCTURES

90 Broad Street, 15th Floor | New York, NY 10004 | T: 212-244-4546 | information@oldstructures.com | www.oldstructures.com

July 8, 2019

Louis Casolo
City of Stamford Engineering Bureau
888 Washington Boulevard
Stamford, Connecticut 06901

Re: Stamford High School Ceilings

Dear Mr. Casolo:
The following is a summary of our observations on site at Stamford High School on June 27, 2019. The condition of the plaster ceilings was examined, as described below, by myself and Lia Pantusa from our office, accompanied by representatives of the Stamford city government and Viking Construction. We performed a visual investigation of conditions at levels B, C, and D of the original 1928 building. (For reference, level B corresponds to the rooms with numbers in the 200s, level C to the 100s, and level D to the 600s.) The building is a rectangle with two courtyards, creating a squared-off figure-8 in plan. The areas examined at these levels are those that you specifically flagged.

This investigation was a follow up to my investigation in 2008, which included an examination of the structural integrity of the black-iron ceiling support system as observed at two rooms and part of a hallway. (I have attached a copy of that report.) My conclusions at that time were the original design of the plaster supports was adequate but was vulnerable to (a) dislodged connections if work took place nearby, (b) removal of original partitions that were providing support to black iron, and (c) rusting if exposed to water from roof leaks or other sources.

Existing Conditions

The original ceiling consists of plaster on expended-metal lath. The lath is supported by "black iron" – light-gage steel – which is in turn supported by the structural steel floor and roof beams. The lath is connected to the black iron by small-diameter wire loops; the small black-iron joists are fastened to the black-iron girders with heavier wire ties. It should be noted that portions of the original structural steel frame of the building have no fire protection other than the plaster ceiling, which provides a fire separation in the same manner as a modern gypsum-board ceiling.

The new ceilings are of typical acoustical-tile on iron-frame construction, suspended at 4 feet on center or less by hangers fastened to toggle bolts through the plaster and lath, fasteners to the structural steel, or both. Branch sprinkler pipes are also fastened in

some areas by toggle bolts to the lath and plaster. In some rooms the plaster has been removed and the new ceilings are attached to the original black iron.

Various conditions were observed, of differing degrees of severity. Note that some areas were not open to observation and not all areas of rooms observed were open to observation. However, an investigation of this type is by its nature a sampling of the conditions. OSE was able to observe conditions in more than 90 percent of the rooms in question and generally saw enough in each room to draw conclusions about that area. Conditions noted:

1. A loose hanger connection for a sprinkler pipe.

   This is potentially dangerous as the sprinkler branch is not properly supported.

   This condition was only observed in rooms 202 and 204.

2. Plaster breaking loose from the metal lath.

   This is unlikely to be hazardous in itself, as all of the areas where this condition was observed were quite small. It is possible that enough plaster could fall at a single location to dislodge a modern ceiling tile below, and cause injury to anyone below.

   This condition was only observed in rooms 202, 204, and (corridor) 208.

   Every place where plaster is missing is the equivalent of missing fireproofing or fire-stopping, and is therefore dangerous in a general sense, reducing the passive fire-protection of the building. Note that in some areas the original ceiling is the only fire separation between adjacent rooms, as the partitions either do not extend up to the underside of the slab above or the partitions have holes above the ceiling.

3. Missing plaster but intact lath, suggesting that plaster previously broke loose from the lath.

   This condition was observed in rooms 208, 228, 230, 234, 238, 246, 261, and 639

   Same as item 2, missing plaster is the equivalent of missing fireproofing or fire-stopping, and is therefore dangerous in a general sense, reducing the passive fire-protection of the building.

4. Small holes in the plaster and lath.

   This condition was observed in rooms 101, 102, 106, 108, 114, 122, 122A, 133, 138A, 142, 149A, 166, 220, 243, 244, 250, 254, 256, 261, 262A, 616, 620, 631, 634, 635, and 639.

   Same as item 2, missing plaster is the equivalent of missing fireproofing or fire-stopping, and is therefore dangerous in a general sense, reducing the passive fire-protection of the building.

5. Large holes in the plaster and supporting structure, with unsupported edges of black iron.

   This is dangerous in that improperly-supported black iron, lath, and plaster is a hazard to people in the rooms below. Depending on where the edges of the holes are relative to the heavier pieces of black-iron, some conditions are dangerous and some are not, but all must be considered to be dangerous unless specifically proven to be safe.

   This condition is common at all three levels with the exception of those rooms where the entire ceiling has been removed. It was observed in rooms 101, 119, 123, 125, 126, 130, 131, 131A, 132, 134, 136, 138, 138A, 140, 143, 159, 163, 164, 165, 167, 201, 203, 205, 208, 218, 224, 226, 229, 230, 231, 232, 238, 240, 242A, 245, 252, 258A, 262, 263, 265, 267, 617, 619, 632, 635A, and 639.

6. Entire rooms or large portions of rooms without the plaster ceiling.

   This is not in itself dangerous, but the original fire-proofing in these areas has been completely removed.

   This was observed in rooms 101, 108, 110, 122A, 221, 223, 225, 233, 242A, 258A, 268A, 619D, 626 and 644. Bare structural steel was observed in rooms 225, 227, 233, 619D, and 626.

7. Water damage to the wire-reinforced concrete slabs.

   This is unrepaired structural damage. Where observed, there was no evidence of imminent failure, but the capacity of the roof slab in question has been reduced.

   This was observed only in room 233, at the underside of a roof.

8. Original partitions removed.

   Similar to item 5, this is dangerous in that the partitions were built supporting black iron, and observations (both in 2008 and now) indicate that new ceiling support was not provided where partitions were removed.

   This was observed in rooms 233, 246, 247, and 637.

Conclusions and Recommendations

Well over half of the rooms observed had one or more forms of damage, and all of the forms carry some increased risk of injury from falling material or from lack of fire protection. In short, systemic repairs of the conditions above the ceilings are required. The existing plaster cannot simply be removed unless this work is accompanied by resupport of the modern hung ceilings and the branch sprinkler lines that are hung from the black iron.

The conditions in items 1 and 8 above should be addressed as soon as possible, as they are immediately hazardous. Any perceived change (for example, plaster dust falling from the seams in the acoustic-tile ceiling) in the rooms with the condition in item 5 should be treated as immediately hazardous. For these items (1, 5, and 8), repairs include the installation of new hanger rods fastened to the concrete slab above the plaster ceiling to provide new support to black-iron.

There are two basic approaches to the general conditions. The incremental approach would be to remove the acoustic tiles in a room, fireproof any exposed steel (with spray-on fireproofing or gypsum-board enclosures), provide new hangers at any free edges of black iron, remove any loose plaster, repair any damaged original black-iron connections with new wire, and then replace the ceilings. This could be done systematically one room at a time.

The overall approach would be to remove all of the acoustic-tile ceilings and all of the plaster and lath, fireproof any exposed steel, and then provide new supports for the sprinkler branch lines and the acoustic-tile ceiling. By the nature of the work, this would have to be performed in large areas (for example, both sides of a corridor between two cross-corridors) at once.

If you have any questions or I can be of further assistance, please call.

Sincerely,

Donald Friedman, PE