

Licensed Professional Engineers New York & Connecticut 185 Meadow Street Naugatuck, Connecticut 06770

INSPECTION REPORT: N. MIANUS SCHOOL, OLD GREENWICH SCHOOL, RIVERSIDE ELEMENTARY SCHOOL, AND JULIAN CURTISS SCHOOL

Prepared For

Greenwich Board of Education 290 Greenwich Ave. Greenwich, CT, 06830





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SUMMARY LETTER



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February 24, 2021

Job No. 21211.00

Client:Greenwich Board of EducationIndividual:Mr. Dan WatsonAddress:290 Greenwich AveCity/State/Zip:Greenwich, CT, 06830Phone/Fax:(203)-625-7400Email:Daniel_watson@greenwich.k12.ct.us

RE: Ceiling collapse at N. Mianus School (309 Palmer Hill Rd.) and subsequent inspections of the ceiling systems at N. Mianus, Old Greenwich School (285 Sound Beach Ave.), Riverside Elementary School (90 Hendrie Ave.), and Julian Curtiss School (180 E Elm St.).

Report:

This report is in response to the ceiling collapse that occurred at the N. Mianus School, Room 201 on Saturday, Feb. 13^{th} 2021. A ceiling assembly consisting of a suspended acoustical ceiling, 2"of plaster on metal lath, and wood furring strips spaced at 12" o.c. and secured to the 2x14 ceiling joists spaced as 16" O.C. failed at the connection between the furring strips and joists. This connection consisted of 0.113" shank diameter plain steel nails embedded 2 $\frac{1}{2}$ " into the ceiling joists.

A visual inspection of the adjacent areas of similar construction revealed that the ceiling was in the process of failing throughout the second floor. Gaps were observed opening up between the furring strips and joists, with the largest being 2" gap (Room 208), leaving only ½" of embedded nail supporting the ceiling assembly, sprinkler system, lighting, and other suspended mechanical components. These components were also attached to the plaster ceiling using toggle bolts, instead of being attached to the supporting structure. This assembly method placed additional load on these furring strip nails.

The extent of this ceiling assembly is shown shaded in red on the attached floorplan. These areas are currently not safe, the plaster ceiling assembly should be removed and replaced with a properly installed drywall ceiling (thickness and assembly type TBD by current architectural, fire and building codes), and all hanging loads should be re-installed and secured to the ceiling structure.

Based on our inspections, information from the Greenwich board of education, and information from maintenance personnel at N. Mianus and the other three schools noted above, the ceiling assembly in question is only present in the area noted at N. Mianus school (Second floor of the original building). Therefore, the ceiling assemblies at Old Greenwich School, Riverside Elementary School, Julian Curtiss School, and other areas of N. Mianus School are not in danger of collapse or failure in a manner similar to the collapse that occurred on Feb. 13th.

Our other observations are as follows:

<u>N. Mianus School</u> – Ceilings at other areas of the school were constructed of metal assemblies, and as such cannot fail in a manner similar to what occurred in room 201. *Due to the potential for water damage of the first floor ceiling plaster caused by the sprinkler system break, it is recommended that the first floor of the original building also have its plaster ceiling removed and replaced.*

<u>Old Greenwich School</u> – Ceiling areas of the original building (outlined in blue on the attached floorplans) were constructed of plaster on wood lath, but not in the manner of the school at N. Mianus. N. Mianus used metal lath as a plaster backing, and wood furring strips at 12" o.c. to level out the lath. Old Greenwich has no furring strips or metal lath, instead relying on wood lath secured at 2" - 3" o.c. to the underside of the ceiling and floor joists. This results in the ceiling being secured with 4 to 6 times the number of fasteners used at N. Mianus. Other areas of the school had ceiling assemblies constructed of steel channels with metal lath secured by pre-punched hooks. Newer areas of the building were constructed with steel and drywall ceiling assemblies.

It should be noted that the ceiling penetrations were extensive at this school. We recommend consulting with an environmental / remediation consultant to determine if any issues are present due to the friable nature of the edges of many of these penetrations.

<u>Riverside Elementary School</u> – Ceilings areas of the original building were observed to be in sound condition. There were very few existing penetrations in the areas with plaster ceilings. It was able to be confirmed that no wood construction was present in the ceiling assemblies of the original building, with the existing ceiling assemblies being constructed of metal joists with metal lath secured to the bottom chords via tie wire, or concrete ceiling assemblies. Due to the size of the ceiling holes clear pictures were not able to be taken. New holes were not made at this time due to the potential for asbestos contamination. The new additions had no wood construction or plaster in their ceiling assemblies.

<u>Julian Curtiss School</u> – Ceiling assemblies were observed to be metal lath secured to metal joists, suspended ceiling secured to metal joists, or suspended ceiling secured to concrete deck. No wood ceiling joists or furring strips were observed in the building

Thank you

Kyle Pustola

Kyle Pustola, E.I.T. Steve Pustola, P.E.





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N. MIANUS FLOORPLANS AND PICTURES







FURRING STRIP

0

ft 35ft

in 2

er3

2" GAP, ONLY 1/2" OF NAIL REMAINS EMBEDDED. 5

TOGGLE BOLTS SUPPORTING SUSPENDED CEILING AND SPRINKLER SYSTEM INSTALLED ATTACHED TO PLASTER ONLY.

SPRINKLER SYSTEM INSTALLED ATTACHED TO PLASTER ONLY.

METAL NAIL "HOOKS" SECURING PLASTER AT CEIILING OF FIRST FLOOR



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OLD GREENWICH FLOORPLANS AND PICTURES

WOOD FURRING STRIPS SECURED AT 2" - 3" O.C. TO WOOD CEILING AND FLOOR JOISTS

CEILING ASSEMBLY HUNG FROM CEILING JOISTS, NO TOGGLE BOLTS.



PRE-PUNCHED STEEL HOOKS IN STEEL JOISTS SUPPORTING METAL LATH

PRE-PUNCHED HOLES TO SUPPORT CEILING AND MECHANICHAL COMPONENTS



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RIVERSIDE ELEMENTARY SCHOOL FLOORPLANS



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JULIAN CURTISS SCHOOL FLOORPLANS AND PICTURES



SUSPENDED CEILING ONLY

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