



March 13, 2015

Mr. Jim Rozycki
Director of Facilities
Oyster River Cooperative School District
36 Coe Drive
Durham, NH 03824

RE: Roof Snow Loads
Oyster River High School
Oyster River Cooperative School District
Durham, NH

Dear Mr. Rozycki,

At your request, Emanuel Engineering, Inc. visited the Oyster River High School located at 55 Coe Drive, Durham, NH on February 18, 2015, to investigate possible roof problems due to snow loads on the roof. Dave Emanuel and I met with you and members of your custodial staff on site. This report summarizes our observations and recommendations.

Dave Emanuel, P.E. and I performed a visual site inspection of the facility, in particular where reported noises were heard, and potential new drywall or masonry cracking had occurred. A list of the visited areas is below. Each area was visually inspected at the potential reported problem, at the wall / occupied area, and above the ceiling to check for obvious deformation, displacement, distress, or signs of failure.

<i>Room:</i>	<i>Observations – Comments:</i>
T-308	Corridor wall was noted to be full height to the roof deck. Full height drywall joint failed. Joint aligns with structural column. Suspect that drywall is not attached properly. No visible signs of structural damage.
T-308	Water damage observed. Checked area above ceiling in the area of the covered bar joist. No visual damage to structural elements was noted, no signs of distress were observed.

C-226	8-9 foot snow drifts were noted outside classroom windows. Maintenance had already removed snow from the drift location once. No damage noted.
C-124A	Corridor below C-226 snow drift was inspected above ceiling grid. No visual damage to structural elements was noted, no signs of distress were observed.

Building plans of the school prepared in 2002 were provided by the School District and reviewed for design loads, which included a roof design snow load for the roofs of 42 pounds per square foot (PSF). The current ground snow load for the Town of Durham, NH per the ASCE 7-05, "Minimum Design Loads for Buildings and Other Structures", is 55 PSF. It is our understanding that Durham currently prescribes a ground snow load of 55 PSF.

The ground snow load is converted to a flat roof design load using several adjustment factors. Using the present day 55 PSF ground snow load, translates to a 42 PSF for flat roofs, which is the same as shown on the drawings. Depending on elevations between adjacent roofs, the snow load increases due to snow drifts and sliding snow onto low roofs. No notes or provisions have been stated on drawings regarding drift loads.

Engineering calculations for the unit weight of snow estimated approximately 24 inches of snow to represent the roof design load of 42 PSF.

Recommendations & Conclusions

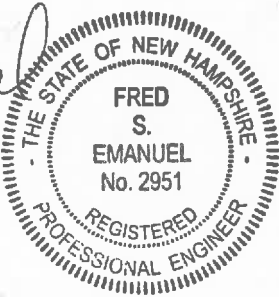
- Without further additional review, calculations, or inspections, we recommend that snow depths on the high school roof not exceed 24 inches.
- As snow removal crews were working at the time of the field inspection, we recommend that snow removal be continued to remove the excess snow at this time and to prepare for the next winter storm.
- Drywall cracks may be repaired but will reoccur when snow loads occur on the roof unless the light gage metal framing is modified by using proper deflection cracks at the top of wall above the observed cracks.
- All roof drains shall be kept free of snow to allow for snow melt.
- There were no indicators found that exhibited structural damage or distress to structural elements.

Please see attached photographs of the inspection areas. Should you desire further evaluation of the roof or have further questions, we are available to assist you.

Very Truly Yours,



Fred Emanuel, P.E.



Attachments: Photographs (19 pages)

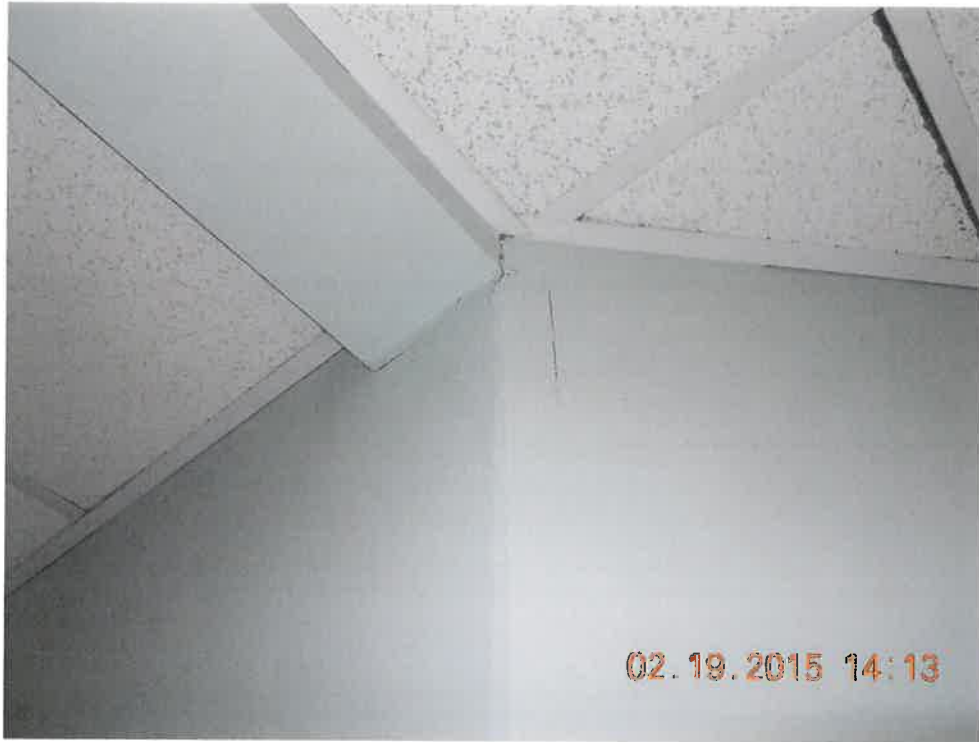


3rd floor corridor



Cracks caused by absence of deflection track







Studs attached directly to roof deck





3rd floor corridor - failed control joint due to inadequate thickness of caulking.





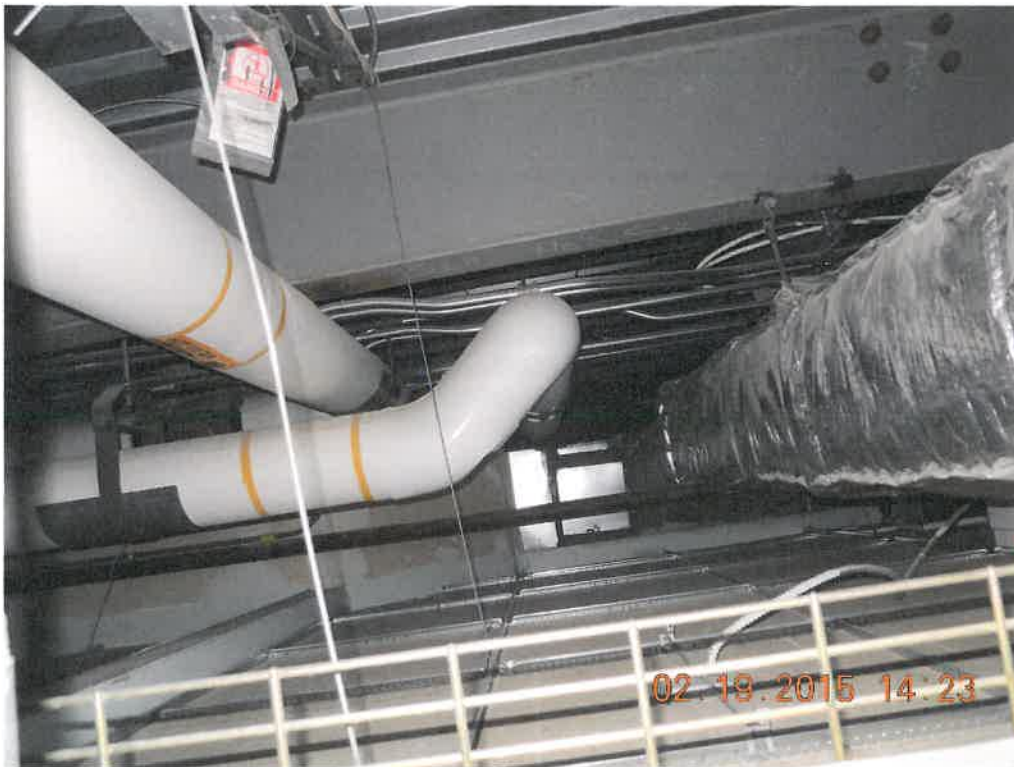
Studs extend to roof deck. No deflection track.







No deflection track in place.





Corridor wall near room T308 / T307. Failed drywall joint.

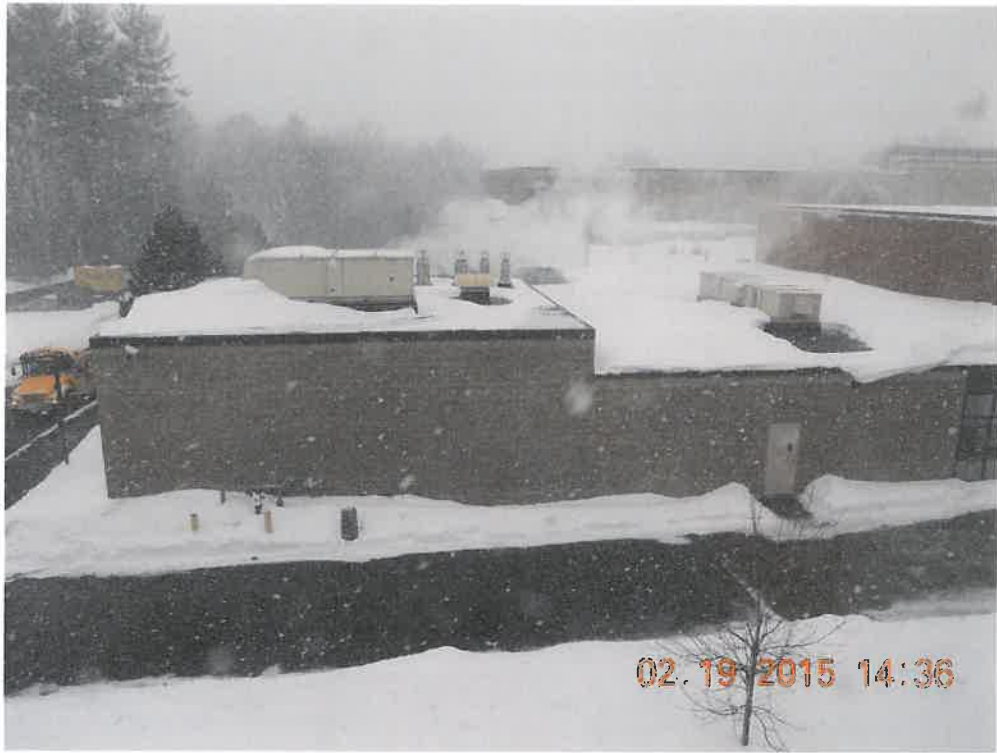


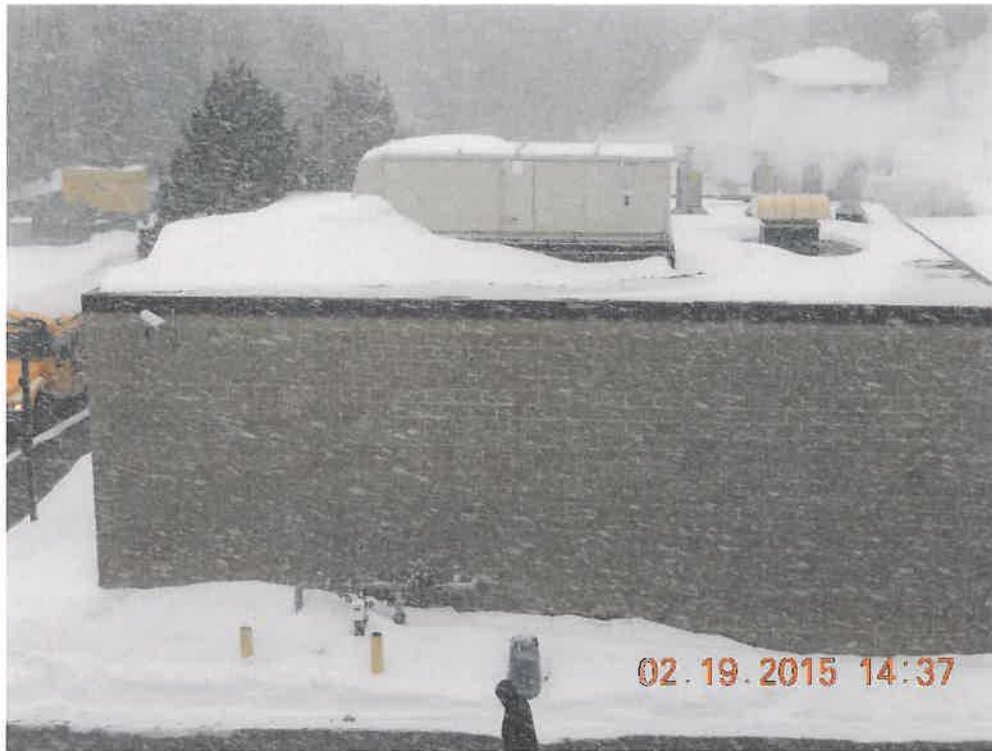


Water damage above ceiling.



Roof top view







Stud wall attached directly to roof deck.



Library roof



Snow stacked against window & translucent panels.



Above corridor near exterior exit. Near C124A



Above corridor wall





Build up of snow on low roof above corridor

