

## Exeter Facility Study

### Structural Evaluation

#### *Town Hall*

The original date of construction is not known. In 1931, the building was modified by removing the fill on the Water Street face of the building and creating a façade out of what had previously been a basement wall. There were considerable interior renovations constructed at the time and a concrete retaining wall was built. A significant structural repair was done to the balconies at some early point in the building's history. It is reported that the balconies were originally hung from the structure above. The alterations included adding structural steel beams, girders, and Lally columns. The building was modified in more recent history to include an elevator and a ramp was built at the south entrance for handicapped accessibility. In 1999 and 2000, a substantial structural repair project took place. It included arresting an area of the second floor that was on the verge of collapse and strengthening the roof framing.

The building is constructed of dimensioned lumber and heavy timber. The large areas at the main hall and the second floor created the need for clear-span trusses. This was achieved by locating the trusses in the attic and providing hangers to the floors below. This resulted in a complex system, which apparently became overloaded. At the location of the repair on the second floor, substantial deflection was allowed to avoid inducing movement at the masonry supports for the truss. All of the floor framing at the elevated floors is concealed by building finishes except at a few isolated areas where ceilings were not installed above the ground floor. There it was observed that 2 inch by 11 inch joists were used to span rooms that are roughly 11 and 13 feet. The size and span of these framing members is in the range of what would generally be considered acceptable to support the 100 psf live load mandated by current code.

The roof framing has been the source of intensive study in 1999 and 2000, culminating in a major repair of the timber framing and masonry supports. It is not within our purview to perform a peer review of the work that was done. It is presumed that the work was inspected by the designer at the time of construction in order to verify completeness. During our review we did note that, one heavy timber truss bearing, near the northwest building corner, has deteriorated due to water damage. This is apparently similar to the problems that occurred at other locations that were attributed to roof leaks. The trusses support rafters that are 3 inches by 5 inches at 20 inches on center. These members are undersized for the spans required.

The perimeter walls are load-bearing, multi-wythe brick walls. In general the walls appear to be in very good condition. Isolated cracking was observed beneath the first floor widow at the northeast building corner. At the same corner, a brick has fallen out of an arch above a window. Since brick arches rely on compression for stability, removal of a brick severely compromises one's integrity. Other problems observed were at the brownstone water table and the other decorative brick units.

EXETER TOWN HALL  
EXISTING MECHANICAL, PLUMBING, AND FIRE SPRINKLER SYSTEMS  
REPORT  
11-11-05

EXISTING CONDITIONS

Mechanical Systems

Two Buderus model GE 315 boilers with gas fired Riello Burners provide heating hot water for the building. The boilers along with boiler room piping mains, in-line pumps, and expansion tank were installed in 2004. The boilers are located in a basement boiler room, with combustion air supplied through sidewall louvers. The system is configured for primary/secondary pumping. Two secondary pumps have been installed, one functioning as a manually selected back-up pump. The system utilizes constant volume pumping and is configured for six distribution circuits. A Tekmar controller was installed to allow for supply water temperature reset based on outdoor air temperature.

The building is heated by perimeter finned tube radiation. In 2004, control valves were installed on most units along with wall mounted thermostats to allow for individual space/zone control. Minimum secondary pump flow is maintained by installation of some constant flow bypass and continuous flow through radiation in a basement side entry area.

Two manually controlled ceiling mounted paddle fans are installed in the auditorium.

The toilet rooms do not have functioning exhaust systems.

Two roof mounted gravity ventilators are ducted to ceiling grilles located above the mezzanine seating area. The airflow path has been blocked off.

Plumbing Systems

The water entrance was not located during the site visit. There is a 40 gallon electric water heater in the basement janitor room. Three toilet rooms and a janitor's sink are located in the basement.

Gas enters the front of the building and the meter is located inside the building. The gas is piped to the boiler room.

Fire Sprinkler System

The fire sprinkler entrance is at the front of the building. Sprinkler coverage has been installed throughout. The street pressure noted at the entry is between 60 and 80 psi.