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May 11, 2009

Mr. Dennis Smet, Town Chairman
Town of Brule
14103 East Seven Mile Road
Brule, WI 54820

RE: Structural Analysis for the Town of Brule's Auditorium

Dear Dennis:

Per your recent request, I performed an inspection to provide a structural analysis for the Town of Brule's Auditorium located in Brule, WI. The inspection was made on April 23, 2009. You, along with several employees of the Town of Brule, were present during my inspection. An interview was held to gain background facts on the facility and to get a better understanding of the history of the structure.

The footprint of the structure inspected is approximately 36 feet wide by 70 feet long. The interior height of the building is approximately 18 feet. This building rests on a 10" wide perimeter concrete frost wall / footing foundation system. The foundation has a number of perimeter vents in place that provide cross ventilation to exchange the air in the crawlspace area.

The crawlspace area is marginally accessible (approximately 20" of clearance) from the main floor level and extends under the entire auditorium section. The crawlspace has a dirt floor without a vapor barrier present. The dirt appeared to be quite dry during my inspection. The attic area is fully accessible from the main floor and was viewed during my inspection.

This one story building is wood framed and was constructed circa 1930's. In the 1960's, a Board Room, office, and restrooms were added. This portion was constructed of 8" concrete block walls, concrete slab floor, and concrete frost walls. This part of the building is scheduled to be razed (demolished) to make room for a new addition in the near future. In the 1970's, new siding was installed. A new medium weight asphalt roofing system was installed in 2004. The existing shingles had been completely removed at that time. A vented roof system is currently in place. It has a main ridge vent that is supplemented by a lower soffit vent. Over the years, the original heating system has been upgraded from wood to coal, then to oil, and now operates with natural gas.

In 2005, a new entryway system with a concrete step and a frost foundation system was installed on the west side of the building. At the time of the new entryway installation, it was verified that the existing building had a perimeter concrete frost wall foundation.

During my inspection, I entered a good portion of the crawlspace and attic. Both the interior and exterior areas were inspected during a walk around. Overall, as noted in my summary, the building is in very good condition. The foundation floors, walls, and roofing system are all very true and structurally stable.

The flooring system consists of 2 x 10's @ 16" on center (o.c.) floor joists. The typical joist span is approximately 12 feet (3 bays of 12 feet each equal the building width of 36 feet). They are supported across the 3 bays with a solid 8 x 8 wood girder resting on concrete piers spaced at approximately 9 feet on center. The subfloor above consists of diagonal 1 x 10 shiplap. The original wood flooring is in place and serves as the finished floor.

The perimeter foundation wall has a wood 8 x 8 serving as a sill plate. There is bridging in place at each bay's midsection. The exterior walls appear to be framed with 2 x 4's @ 24" o.c. and are covered with sheathing and a lapped siding. This was not verified, but the interior paneling nailing pattern indicates that.

In the attic area, the roof framing consists of a site assembled roof truss running east and west above the main Auditorium. It appears to be very stable and structurally sound. The rafters (top chord of truss) are 2 x 6 at 24" o.c. The roof sheathing is a 1 x 12 shiplap. A series of collar ties are in place on the gables that run north and south on both ends of the Auditorium. 2 x 4's @ 24" o.c. are attached to the underside of the trusses, which in turn supports the interior ceiling system. The gable end wall framing consists of 2 x 4's @ 24" o.c. with shiplap sheathing and siding. The estimated snowloading (live load) capabilities are estimated at approximately 35 to 40 pounds per sq. ft. (psf), which is adequate for this circa building. The roof trueness is very good for this age building. An eave and rake flare is built into the roofing system.

The following are my observations and **recommendations** based on my structural inspection:

1. Consideration should be given to installing a 6 mil vapor barrier over the dirt in the crawlspace area.
2. Perimeter insulation (R-10 in value) should be added to the inside surface of the perimeter crawlspace foundation walls and box sill cavity.
3. The insulation in the attic area comes in contact with the roof sheathing. A clear airflow should be maintained to the lower soffit vents. Propervents should be installed between the top chord of the trusses where the insulation comes in contact with the roof sheathing.
4. The exterior grade should be added to around the perimeter of the building so

that stormwater will flow away from the building. The present condition has the grade backpitched toward the foundation walls, allowing a portion of the stormwater to flow back against the building.


5. Consideration should be given for the installation of a seamless gutter system to keep the stormwater away from the building foundation.
6. The ceiling tiles in the Auditorium show signs of sagging. Refastening, or replacement should be added to your future repair listing.

Approximately 106 digital photos were taken during my inspection of the interior space, exterior crawlspace, and attic areas.

In summary, it is my opinion that this facility is in **very good structural condition**. With routine scheduled maintenance it will serve the Township well for many years to come. This building will allow the planned addition to the east to be attached without any concerns about the structural integrity of the entire structure, provided reasonable design practices are incorporated into it.

If you should have any questions, please do not hesitate to contact me at (715) 682-0330.

Sincerely,


Stephen G. Schraufnagel, Architect
LEED Accredited Professional

