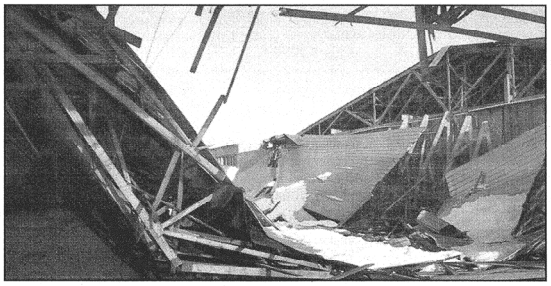
The Last Straw

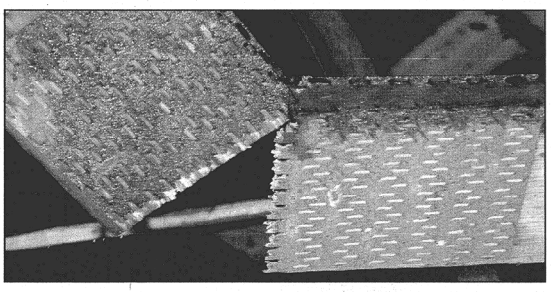
– Failure of wood structure as mushroom composting facility

Farm Buildings .....

The Last Straw

By Dirk Kerkhoff, President, BuildWorks Construction, Rosedale BC





The "Straw Farm", an 18,000 square foot mushroom composting facility on South Parallel Road in Abbotsford, BC, collapsed at the end of January due to failure of the wood truss roof system. It had been in use for less than 5 years.

Corrosion of truss plates

Close inspections of the galvanized metal truss plates show an advanced stage of corrosion. The bottom chords of the light weight wood trusses, operating under tension, became separated, and a little sprinkling of light snow, was the proverbial "straw that broke the camel's back", causing the trusses to fall to the floor and imploding the entire structure.

This problem is not uncommon in this industry, as more such buildings have been, and still are being constructed with inadequate care being taken to ensure protection of the primary structural systems. A collapse last year of another mushroom composting building on Lefeuvre Rd, also in Abbotsford was similarly the result of ammonia-laden air rapidly corroding the galvanized connector plates. That particular building was only about one year old.

Coating of truss plated recommended

These problems beg the question. Is it possible to safely use wood frame buildings for composting purposes? At the very least the metal connector plates should be protected with a special coating as recommended by the Truss Plate Institute of Canada. Such coatings, usually brush applied, consist of specially formulated epoxies, coal-tar, or asphaltic mastic paints. At best such treatment may extend the serviceable life of the truss connector plates, but an ongoing building maintenance program is needed to ensure continued protection. Even though such protective treatment is recommended, it is often neglected.

Ventilation, a key factor

Ventilation of a composting facility is another key factor in extending the life of the building. The very process of composting however results in large volumes of fog being created, often more than can be efficiently extracted from the building. Besides, venting to the exterior is likely to result in neighborhood complaints about bad smells.

The Straw Farm had a substantial amount of air inlets on both sides of the building, and the front of the building was fully open. In spite of this the problem developed to the point of total failure.

Some projects attempt to contain all of the fog within the building space, by creating a tight seal separating the composting environment from the buildings structure. However, anything less than a 100% performance of such a design strategy, will actually cause the moisture to be trapped inside the walls and roof assemblies - the composting industries' version of the Leaky Condo Syndrome, in reverse.

New technology

An alternate method has been developed by Transform Compost Systems Ltd., in conjunction with BuildWorks Construction Inc., and applied on a new composting facility recently completed for the University of Alberta, in Edmonton. It utilized a secondary enclosure over the composting area, or, as was explained by Dr. John Paul, President of Transform, "This unique tent within a tent concept for this facility, isolates corrosive air from the building, reduces the cost, and provides a better working environment inside the composting facility". The primary building structure consisted of a MegaDome structure, comprised of a single skin waterproof membrane over a hot-dipped galvanized steel arch frame. With this method moisture is kept away from the primary building structure, and cannot be trapped within wall or roof systems. Such systems could be readily adapted to the mushroom composting processes.

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References:

- Dr. John Paul, President, Transform Compost Systems Ltd. (604) 504-5660 http://www.transformcompost.com or email www.transformcompost.com
- Truss Plate Institute of Canada.

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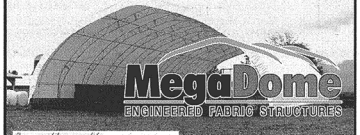

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