Commentary-Dave Pasolli-Western Wood Truss Association of Alberta

When Katerra was founded in 2015 it was going to be the disruptor of the construction industry that had not really changed in decades according to them. It was an incredible compelling story; they were going to turn the process of building on its head by vertical integration, applying technology to manual methods, and best of all using techniques only found in Silicon Valley. They even had a founder that came from Tesla, who would not want to get on board? Investment banks could not lend them money fast enough.

But construction turns out to be a bit different than a tech start-up and there is a difference between raising money and making money. Silicon Valley does appear to produce a lot of these companies that have a great idea, but the idea does not actually work.

There is a great documentary on Netflix called "The Inventor: Out for Blood in Silicon Valley" telling the rise and fall of a company called Theranos and its founder Elizabeth Holmes. She had the greatest invention ever conceived for doing blood tests; the only problem was it didn't work.

Following is an article on Katerra that was first published in the Wall Street Journal.

How a SoftBank-Backed Construction Startup Burned Through $3 Billion

Katerra's downfall shows how Silicon Valley's strategy of growth at any cost can backfire in complicated industries like real estate

Originally Published by: *The Wall Street Journal — June 29, 2021*

By Konrad Putzier *and* Eliot Brown

| Photographs by Shelby Knowles for The Wall Street Journal

Venture-backed startup Katerra Inc. aimed to revolutionize the construction business by mastering every element of the trade at once. Instead, its June bankruptcy filing made clear just how difficult it is for Silicon Valley to disrupt this complex industry.

The firm's downfall wiped out nearly $3 billion of investor money, making it one of the best-funded U.S. startups ever to go bankrupt. Katerra thought it could save time and money by bringing every step of the construction process in-house—from manufacturing windows to factory-built walls to making its own lightbulbs.

It sold the idea to a deep-pocketed roster of financial backers, including SoftBank Group Corp., Soros Fund Management LLC and the Canada Pension Plan Investment Board. At its peak, the company was valued at nearly $6 billion.

But Katerra never managed to do very well at all the aspects of construction it hoped to master, former employees say, leaving some of them exasperated at its recent demise.

“You guys had the golden goose, you had all that money from SoftBank and at the end of the day it was all pissed away,” said Chris Severson, a former construction-cost estimator at Katerra.

Katerra’s failure is the latest sign that the hypergrowth strategy employed by social media and software companies faces challenges in complicated, slower-moving industries like real estate.

Its bankruptcy also highlights the difficulty of modernizing construction, which accounts for around 4% of U.S. gross domestic product but still operates largely the way it did 100 years ago.

The company is in the process of crafting a restructuring through a chapter 11 bankruptcy process—one that involves selling some assets and keeping its international operations, a Katerra spokesman said.

The Menlo Park, Calif.-based company was co-founded in 2015 by a group of entrepreneurs including Chief Executive Michael Marks, the former CEO of electronics manufacturer Flextronics International Ltd.

Katerra’s strategy was to bring the electronics industry’s end-to-end manufacturing process to the construction business. The firm would buy materials and fixtures like sinks and faucets in bulk, skipping the middlemen and selling them directly to general contractors. When the company found general contractors were reluctant to use their products, Katerra took on that role, too.

Properties would be built with assembly-line-made parts in its own factories and shipped to sites managed by its in-house construction business. Katerra would then turn them into apartments, hotels or offices designed by its architects, all with the help of its in-house software.

This would streamline the process and enable an apartment building to be built in as few as 30 days, slicing off many months that the process would take through traditional construction.

Katerra managed to succeed with some of this top-to-bottom process, but few developers were interested in everything Katerra offered.

Still, as Katerra's business model became more complex, it found a new backer in SoftBank. With the help of the Japanese conglomerate's nearly $2 billion investment, Katerra bought general contractors across the U.S. and a building-parts manufacturer in India. It was further aided by $440 million in debt from Greensill Capital, a SoftBank-backed lender that tumbled into insolvency in March. Eyeing international expansion, Katerra signed a contract to build thousands of homes in Saudi Arabia.

"Everyone's so excited about the mission that everybody just says yes to everything," recalled Erica Storck, one of the company's first employees. 'It gets out of control."

In its race to boost revenue, Katerra agreed to build properties before it had figured out how to mass-produce building parts and get them to its projects cheaply and quickly enough to make the model work, say former employees, customers and investors. Architects designed buildings with parts from Katerra's factories, only to learn that the parts wouldn't be ready. Losses on projects piled up.

The company often signed contracts with prices based on rosy projections and then turned to its in-house team of estimators to figure out how much it would actually cost. Often there was a gap of millions of dollars, said Mr. Severson, the former Katerra estimator.

"We just beat our heads against the wall going: 'No you can't, it's not possible," Mr. Severson recalled. In one case, the company briefly considered leaving air-conditioning units out of a California student-housing development to make the numbers work, he said.

Katerra's Legacy at Livermore construction site, pictured on June 26, in downtown Livermore, Calif. The site now sits unfinished after the company declared bankruptcy in June.

When architects and engineers raised concerns, Katerra executives would at times hold up an iPhone, telling the skeptical workers that if it could be done for phones, it could be done for apartments, a former employee said.

Rather than mass-produce a single type of building, Katerra built offices, hotels, single-family homes and apartment buildings of varying heights. That made it much harder to mass-produce prefabricated parts in factories and reduce costs because a wall panel designed for a three-story apartment building didn't work for a 10-story building, former employees said.

The contractors it acquired also often balked at buying parts from Katerra, preferring their old subcontractors and suppliers, these people said.

By early 2020, the company was in danger of running out of money. Mr. Marks's solution was to go even bigger. To realize his seamless vision, he believed Katerra needed to also be a developer that would own stakes in the real-estate projects it built and get a cut of their profits. That, he said, was where the real money was, former employees recalled.

The company's board, though, ousted him early last year. His successor, the former oil-field-services executive Paal Kibsgaard, cut costs in part by shrinking the company's research and design and manufacturing divisions. The cuts came too late, and Katerra filed for bankruptcy protection on June 6.

Former employees said they still believe in the idea of a vertically integrated, automated construction company. Multiple former executives said they believe cost overruns on early projects obscured more recent progress elsewhere in the business, and Katerra could have been profitable if it pivoted to more development and stayed focused on growth.

Still, many in the industry think a more focused approach is better.

"The problem's not money," said Gerry McCaughey, whose Entekra LLC makes factory-built wood frames for houses. "They were trying to go end-to-end on everything—and that's what failed."

If you have an idea for a commentary or would like to submit your own commentary for a future newsletter please let me know at dave@wwta.ab.ca

Economic Update

In Alberta, urban housing starts totaled 2,723 in July 2021, a year-over-year increase of 40%. Canadian housing starts increased by 8% over the same period. In Edmonton starts were up 8.19%, while Calgary saw an increase of 90.5%. Total starts year-to-date are up 42.5% compared to the same period in 2020.

Housing Starts Alberta

	Jul-21	Jul-20	% Change	YTD 2021	YTD 2020	% Change
Alberta	2723	1944	40.07%	16854	11827	42.50%
Edmonton	1017	940	8.19%	6872	5960	15.30%
Calgary	1404	737	90.50%	8279	4690	76.52%

Three Reasons to be Excited about the Post Covid Economy

By Todd Hirsch

It's hard to be an optimist these days. The health pandemic is taking lives and the economic crisis is closing businesses. Not much to cheer about here. In fact, it seems rude to be upbeat.

Yet in spite of these hardships, here are three reasons to be excited about a post-COVID world.

1. The pandemic will accelerate the **fourth industrial revolution**. After the mechanical revolution (1800s), the electrical revolution (early 1900s), and the digital revolution (1960s), the fourth revolution to transform our economy is the cyber revolution — a world of artificial intelligence, machine learning, blockchain technology and virtual reality. This current revolution has been around for a few years, but it hasn't yet been truly transformational. The pandemic will make the practical applications of these technologies more obvious. Travellers may be less likely to pack into airplanes and pile into the all-you-can-eat vacation destinations, but they may be more willing to try virtual reality experiences. Physically distancing may become more normal, but A.I. and blockchain technologies can create whole new ways of communicating that we've been slow to embrace. The post-COVID world will give us the nudge in the right direction, and that will boost productivity.
2. The pandemic will **reinvigorate the importance of community**. In the early days of the crisis, many of us have likely had a chance to re-examine what, and who, is important. We haven't been able to physically embrace those we love and cherish, but we've been awakened to their presence in our lives. In his 2019 book "The Third Pillar: How Markets and the State Leave the Community Behind," economist

Raghuram Rajan discusses how society requires a balance between capitalism, government and community. If any one of them becomes too strong (or too weak) relative to the others, things get out of balance. Problems such as falling productivity, income inequality and the rise of populism start to emerge. Rajan's book describes how community has been the weakest and neglected pillar in our modern Western economies. The pandemic will awaken us to the importance of community, which (if we pay attention to it) will create a healthier balance between it, our market economy, and our governments.

3. The pandemic will **stimulate creativity and innovation**. These elements have long been recognized as economically significant, but they were easy to ignore when profit maximization and ROI were the only metrics that mattered. But for a multitude of sectors — from energy to tourism, and from global supply chains to arts and culture — everything has changed. Waiting for a return to normal is a terrible strategy because "normal" isn't coming back. The COVID crisis is forcing a wholesale re-examination of how many businesses will operate in the future. That will require enormous doses of creative, innovative thinking. Business leaders who disregarded the value in creative thinking will be left behind. The pandemic will also stimulate innovations in how we work. During the pandemic, many office managers are discovering new ways work can be done remotely, challenging the notion that workers need to be in supervised cubicles to be productive. The old 9-to-5, Monday to Friday work week is now more solidly in the Museum of the 20th Century.

Make no mistake: the COVID crisis is tragic. The human and economic suffering will be the worst we've known in modern times. More losses are coming. There will be no V-shaped recovery.

Still, if we allow ourselves a moment's luxury to think positively, good things are on the horizon. A nudge to embrace productivity-enhancing cyber technologies, a chance to ignite the power of community, and a crash course in creativity and innovation — these are the positives that will pave the path to the future.

Todd Hirsch is the Vice President and Chief Economist for ATB Financial. For more than 25 years, he has worked as an economist for organizations including the Canada West Foundation and the Bank of Canada.

He is the author of four books. His latest, Spiders in COVID Space: Adapting during and after the pandemic, was released in March 2021. He serves on the boards of Calgary's Glenbow Museum and the Alberta Ballet. He is also an advisor to the Dean of the Chiu School of Business at Bow Valley College in Calgary.

Todd's podcast, titled The Future Of, won a national award in 2021, and was ranked #2 in the top Canadian banking podcasts.

Quality Control

Plating over Lumber Defects

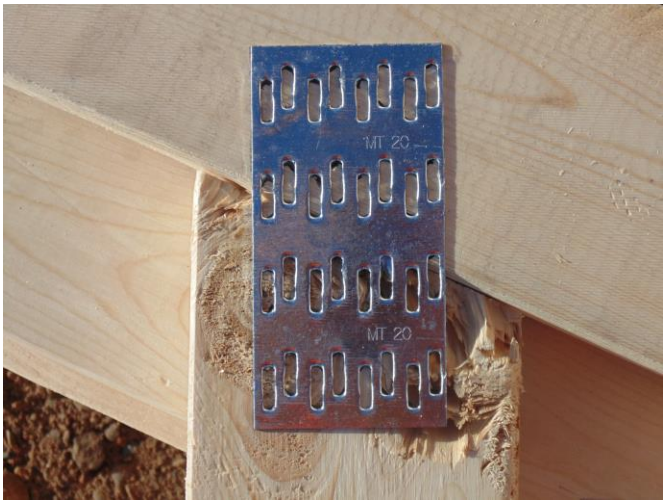
Lumber is not perfect; it had defects such as knots, wane, pitch pockets, unsound wood, and grub holes. All are allowed within certain criteria for the grade of lumber. But you have to remember that the allowable defects in the lumber ensure that it meets the design properties, they have nothing to do with the lumber being a raw material for a truss. There is no specific grade for truss lumber, so we have to work with what we get.

Sometimes these defects fall where we want to install a metal connector plate, usually at the end of the cut component, and when plating we have to consider this. When the particular plate size in picked and located on the joint it assumes that all the wood under it is good and that the teeth will be able to bite into the wood effectively.

It is also the responsibility of the Sawyer to ensure that major defects do not show up in critical joints like the heel joint, pitch breaks, or tension splices. If you are building a 100' farm truss with a 2x8 bottom chord and there is a large pitch pocket at the heel that lumber should be rejected before it gets to the table.

As a truss builder you have the responsibility to notice any defects before plating the truss and deal with them in one of three ways.

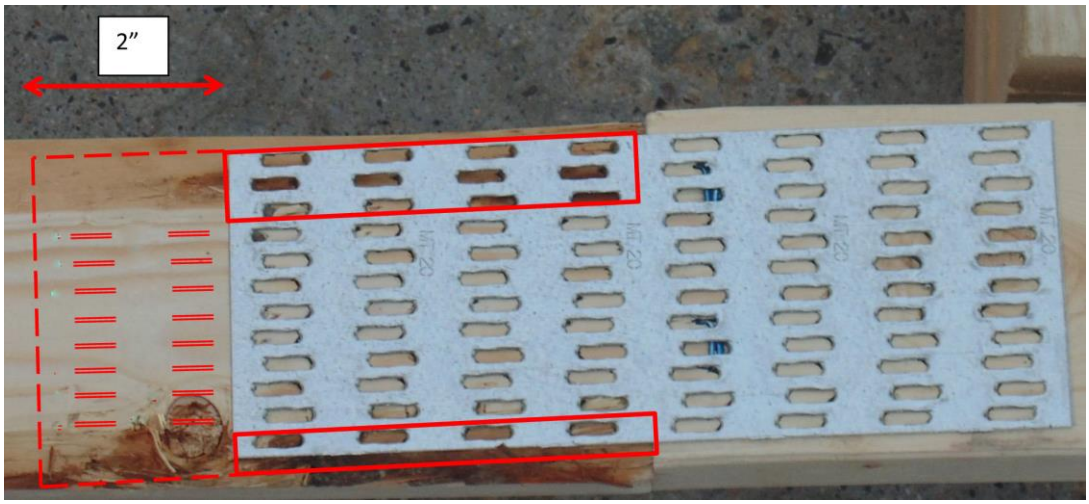
1. If the defect is large and ugly reject the piece of lumber and get another recut.



Although this is a small plate you there are no effective teeth into the vertical web. If the knot runs through the lumber there are most likely no effective teeth from the bottom side plate as well.

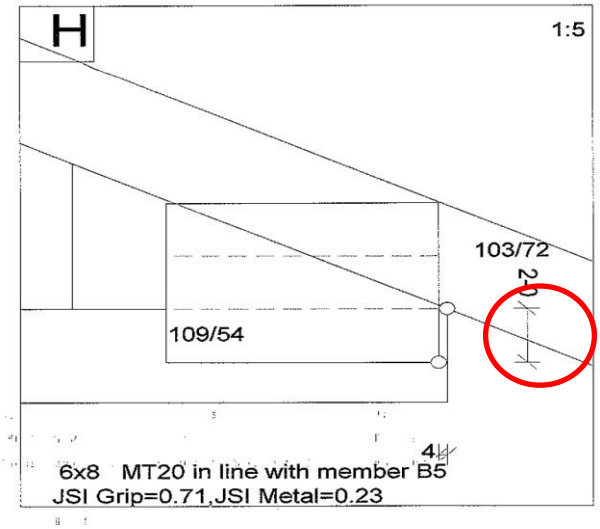
2. If the defect is not too large you can choose to install a larger plate to make up for the in-effective teeth. Count the slots that are into the defect and choose a plate that will have that many extra teeth into the piece of lumber that is affected. Make sure that

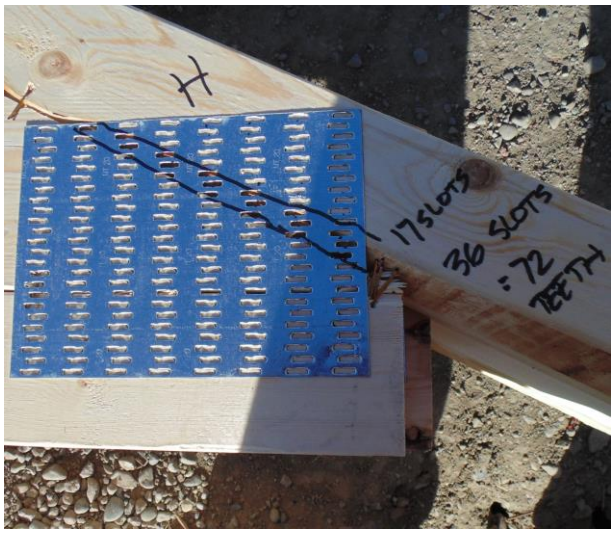
you choose a plate that is the same gauge as the specified plate. Installing a heavier gauge plate is not acceptable.



In the example above a 3x8 plate has 16 slots into wane in the left piece of lumber. The truss assembler should then pick a plate that is 2” longer so that there are 16 more slots into good wood.

3. If the truss assembler has the enlarged joint details (recommended) they can do a tooth count to ensure that there are enough effective teeth after discounting the teeth that are ineffective.

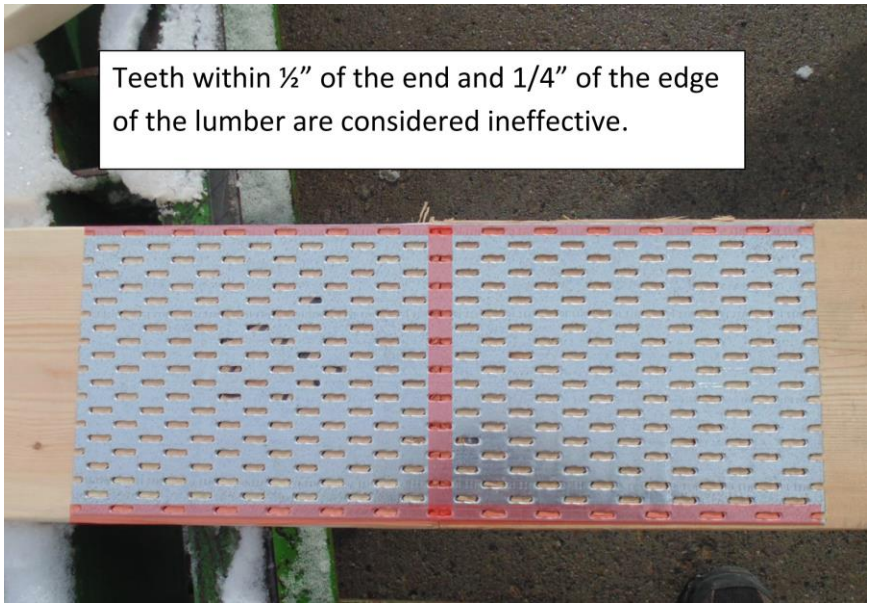




In joint H there is wane in the top chord making 17 slots of teeth ineffective and 36 slots of teeth into good wood. The joint detail tells us that the minimum number of teeth into

the top chord has to be 72. 36 slots with 2 teeth per slot equal 72 teeth, so it just meets the minimum requirement.

Teeth too close to the edge of the lumber are not considered to be effective, so this is something that you have to keep in mind. Teeth within ½" of the end and ¼" of the edge are not counted.



As you can guess, when coming to large defects it is better to deal with the problem at the saw instead of at the table trying to figure out what to do.

If you ignore defects under the plate by not addressing them it may mean that the plate has to be removed and a larger plate installed. Remember that when removing a plate the lumber is affected and the teeth going into the damaged lumber are considered 50% effective. Therefore, you have to choose a plate with twice the minimum required teeth to replace the removed plate.

I will review plate removal in another newsletter.

For more detailed information about placing plates check out the module #402 Placing Plates and #105 Quality Requirements at www.trusstrainingonline.com

Health and Safety Toolbox

This month I would like to focus on one of the tasks associated with building trusses on a table. The hazard assessment process tells us that we must first identify the job, the tasks associated with the job and the hazards associated with the task, and finally the controls to eliminate or lower the risk.

Job-The position a person has in an organization (e.g. truss builder).

Task-The activities a worker does as part of their job.

Safety Hazard-Anything that could cause injury or damage

Control-The actions taken to eliminate or lower risk at work. Methods of control fall into one of three categories: engineering, administrative, and personal protective equipment (PPE).

Usually when reviewing hazard assessments for the job of building trusses the tasks usually include things like: placing lumber, stapling, hammering, moving the press, etc. In a typical truss plant definitely one of the hazards associated with building trusses is getting on and off the table and you have to make sure that you have a safe working procedure (SWP) for this.

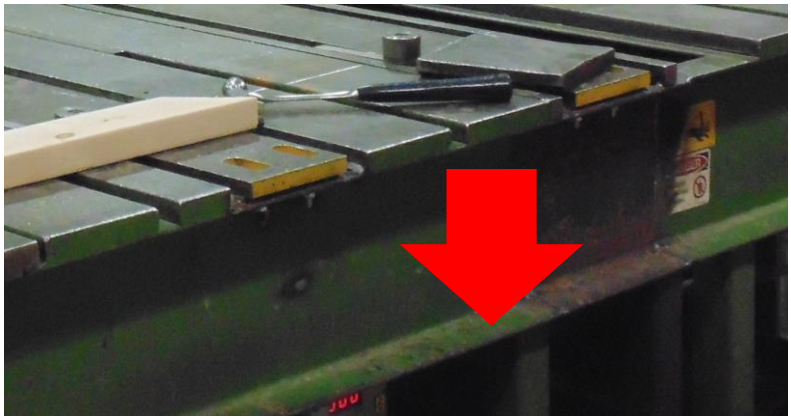
I am not sure that "be careful jumping off the table" is a sufficient control to prevent injury.

The best way to develop a SWP that works is to involve the workers. They are the ones that have to follow it. This may be done at a "tool box" meeting or formally through your Joint Worksite Health and Safety Committee when hazard assessments are reviewed. It is quite often the workers that will come up with the best idea. One of the problems with this particular task is that any physical solution or engineering control may interfere with the operation of the equipment.

Step installed to access the end of the table –Left

Step installed along the length of the gantry-Right

If you choose to not have the workers vacate the table during the pressing process, you also have to have a SWP for staying on the table. This training would be considered and administrative control.



Quite often builders use the bottom flange of the table as a step, but it is not designed to be a step and has the potential to cause injury from slipping off it.

While you are discussing the ergonomics of standing at the table you also may want to consider the feet of your workers and install some mats.

Rubber anti-fatigue mats

dismounting the table

Of course, most injuries actually caused by getting on and off the table result from getting off the table by jumping, causing sprains. Make sure in your training you discuss the proper way of getting down from the table. Jumping off the table onto the rail can cause serious injury.

Whether you control the hazard by engineering control (steps) or through administrative controls (training) you have to make sure that it is included in your formal hazard assessments and that the workers follow your requirements.

For further training check out modules #102, #103, and #401 at www.trusstrainingonline.com

WCB has a new poster that you may want to put up on your safety bulletin board on the steps to take when you are injured at work to reflect changes in legislation.

https://www.wcb.ab.ca/assets/pdfs/employers/123_english.pdf

There is also a good bulleting on wild fire smoke hazards on the Alberta pub store: https://open.alberta.ca/dataset/e5806cdb-ad57-454e-b89b-761e5286a3da/resource/9ad4a851-3f5e-4699-8256-0a6e4a4a8cbb/download/lbr-wildfire-smoke-fi007-2020-05.pdf

Similarly to the Quality topic the WWTA would like to give you a monthly item you can discuss when doing your Safety Toolbox meeting.

The Alberta Government has a new format OHS eNews you can subscribe to with all kinds of good material at: https://ohs-pubstore.labour.alberta.ca/

News and Events

The Government of Alberta (specifically Alberta Agriculture and Forestry) is examining some funding supporting Alberta's Recovery Plan and there is the potential for some of it to support our industry.

They would like to hold a virtual meeting tentatively scheduled for **Aug. 23** 9:00-11:00 to meet with our members to discuss and get our feedback.

The have identified two streams that may support a grant program: market expansion and access to capital.

The session will be two hours long and will focus on ways to increase growth and competitiveness in the value-added wood manufacturing industry. The goal of the meeting is to:

1. Validating Government's current analysis on the industry's barriers to growth and soliciting feedback on how to grow the value-added wood manufacturing industry in Alberta.

2. Vetting options which the Government of Alberta has developed to alleviate these barriers, specifically,
    a. Providing funding to assist value-added wood manufacturers in market expansion.

b. Developing a grant for value-added wood manufacturers to access capital.

They are open to having a representative from each of our members attend the meeting, so if you would like to participate please contact: **Taylor Massicotte at Taylor.Massicotte@gov.ab.ca or 780-217-4978.** The agenda and meeting information will follow upon confirmed participation of your organization and a meeting time is determined.

Formaldehyde Emissions from Composite Wood Products Regulations: SOR/2021-148

There was a recent publication in the Canada Gazette on new regulations for formaldehyde emissions in composite wood products. (June 17, 2021) https://gazette.gc.ca/rp-pr/p2/2021/2021-07-07/html/sor-dors148-eng.html

Some of you may be getting notices about it and they would like to know if this is going to effect anything when it comes into force in January 2023.

After consulting with our EWP members the short answer is NO it does not look like it will have any effect on the products you distribute. Section 4 appears to exclude our types of products from this requirement. That is not too surprising, as often the focus of these efforts is on the MDF furniture-type of products.

Non-application

4 These Regulations do not apply in respect of

(b) finger-jointed lumber;

(c) the following structural wood products in which moisture-resistant adhesives are used:

(i) plywood that complies with sections 6 and 7 of the Canadian Standards Association standard CSA O121, entitled *Douglas fir plywood* or CSA O151, entitled *Canadian softwood plywood*, or with section 5 of the National Institute of Standards and Technology standard NIST PS 1, entitled *Voluntary Product Standard PS 1 Structural Plywood*,

(ii) Oriented Strand Board and panels that comply with section 5 and Appendix GA of the Canadian Standards Association standard CSA O325, entitled *Construction sheathing*, or with sections 5.2 to 5.4 of the National Institute of Standards and Technology standard NIST PS 2, entitled *Voluntary Product Standard PS 2 Performance Standard for Wood Structural Panels*,

(iii) composite lumber that complies with sections 4.3 and 6.4 to 6.10.2 of the standard ASTM D5456, entitled *Standard Specification for Evaluation of Structural Composite Lumber Products*,

(iv) glued-laminated timber that complies with sections 5.1, 5.3, 6.1 to 6.8.1 and 7 of the Canadian Standards Association standard CAN/CSA-O122, entitled *Structural glued-laminated timber*, or with sections 5 to 7 and 9 to 12 of the American National Standards Institute standard ANSI A190.1, entitled *Standard for Wood Products – Structural Glued Laminated Timber*,

(v) I-joists that comply with sections 5 and 6.2 to 6.6.3 of the standard ASTM D5055, entitled *Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists*, and

(vi) cross-laminated timber that complies with sections 5, 6, 7.2 to 7.2.1, 8.2, 8.3, 8.5 to 8.5.6.2 and 9.3 of the American National Standards Institute standard ANSI/APA PRG 320, entitled *Standard for Performance-Rated Cross-Laminated Timber*;

Virtual Meetings

One day we will get back to meeting is a room I hope, but in the meantime if you have any topics you would like the WWTA to hold a virtual meeting on please let me know.

WWTA Online Training

If you have not yet taken a look at the WWTA online training program I would encourage you to, as no doubt you will be hiring new workers in the near future and it is a good method to get them productive earlier and safer. If you want an overview of the program go to the WWTA website at: http://www.wwta.ab.ca/truss-training-online.html

Did You Know?

Quite often your customers get confused about what you are quoting. Is it as per the plans and specs? Is it the most economical? Are the headers included? The list goes on and it becomes hard for the builder to know exactly what is included. This can of course lead to confrontations about what was supplied.

The WWTA created a checklist “What is included in your quote” and it can be found on the WWTA website in the builders section: http://www.wwta.ab.ca/builders.html

If you would like the template to modify it to fit your practices, just send me an e-mail.