

Commentary-Dave Pasolli-Western Wood Truss Association of Alberta

How Far Can We Go with Technology?

While listening to Jackie Rainforth at our meeting June 8th talking about **Rise Above the Competition: Embrace Disruption in the Post-Pandemic Era** my mind started going.

While the industry has advanced with technology over the last several decades from designing trusses with slide rulers to sophisticated design programs that are integrated with the saws, jiggling, and plate placement, how much farther can it go?

Can truss plants leverage artificial intelligence (AI) in various ways to further enhance their operations and improve efficiency? The ones that do will no doubt be the last ones standing.

As Jackie mentioned, no one that was renting videos at Blockbuster in the 1990's thought that they would have a completely different way of getting their entertainment in a couple of years.

When I looked at what we do the most obvious area to implement AI is to streamline the process of quoting jobs, while ensuring accuracy and efficiency.

One of the most inefficient and costly things we do is have a high paid designer almost completely design a job, just so that we can quote it. When you consider that there are sometimes 5 or more other truss plants spending the same resources for the same job that only one will be successful getting it truly is a waste of resources that could be best spent in some other manor.

The company or software provider that can develop algorithms that can analyze historical data, including previous jobs quotes and actual production costs, to develop models that can estimate the costs will have a significant advantage.

Every truss plant has vast data on past jobs that could be harvested to estimate jobs with a few input factors.

Just a couple of months ago if you wanted to research something on the internet you would go to your search engine and surf the web for information. Now with programs like ChatGPT you can simply ask a question and it will search everything written and provide you an answer. I used in in writing this article.

By considering a few factors such as load, spans, complexity and other relevant parameters, AI could generate accurate estimates for new jobs reducing the manual effort and maybe even minimizing human error.

AI could potentially assist truss plants in determining competitive pricing for their quotes by analyzing market trends, competitor pricing and historical data. They could even suggest pricing strategies that balance profitability and competitiveness and help truss plants adjust their pricing based on factors like market demand, material costs, and capacity utilization.

What about real-time cost updates? AI could integrate with the truss plant's data systems and monitor real time changes in material prices, labour costs and other factors that impact job quotes. Algorithms could ensure that job quotes are based on the most up-to-date data, enabling truss plants to respond quickly to market fluctuations and adjust quotes.

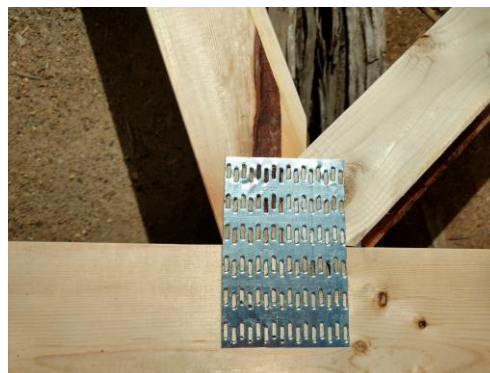
AI could even analyze historical data and identify potential risks associated with specific types of designs and project requirements. By considering previous project outcomes, AI could help truss plants assess the risks involved in a job and incorporate them into a quote. This could lead the company to better-informed decisions when quoting jobs.

Imagine if you could use AI to consider lumber market trends when you are quoting a job that will not be built for six months.

What if you could reduce your estimation cost for a multi-family job from 2 weeks to 2 days. Of course, the builders would get used to this and start to expect a quote in 2 days.

Laser systems and automated jiggging are advances that have improved efficiency, reduced labour costs, and improved quality but could they do more? A laser system indicates where the plate is supposed to go, but what if it could actually tell the builder if it is placed correctly with a warning. What if the laser could identify wane that reduces the number of effective teeth and projects a bigger plate to account for it. OMG this blows my mind.

Ineffective teeth under a plate



These new automated saws are also amazing, but they still are susceptible to the number one quality issue our industry faces, imperfect input material. By using sensors would it be possible for saws to identify defects in the lumber at the plate location of the piece and indicate that the plate has to be up sized? Or even that the piece is not suitable and puts it back into inventory to be cut for another component.

What about quality control? Today we while we try to make sure that issues are resolved before the truss is finished, we still rely on doing truss inspections on the finished truss. What if AI powered vision systems could detect any defects during the manufacturing process and flag them for correction prior to the truss being completed.

Probably one of the worse things that can adversely affect truss plants is production stopping due to a breakdown. AI can enable predictive maintenance strategies by analyzing sensor data from machinery and equipment in the truss plant. By monitoring parameters, such as temperature, vibration, or power consumption, AI algorithms can detect patterns and identify potential maintenance issues before they lead to equipment failure.

Supply chain optimization: AI could assist in optimizing the supply chain by analysing various factors such as demand patterns, inventory levels, transportation logistics, and market trends. AI algorithms can generate accurate demand forecasts, identify potential bottlenecks, optimize inventory levels, and suggest the most efficient routes for transporting trusses.

We are hearing more and more about Environmental Product Declarations and the efficient use of energy. It is possible for AI algorithms to analyze real-time data to optimize energy consumption within a truss plant. By identifying areas of energy wastage, suggesting operation adjustments, and optimizing resource allocation, AI could help truss plants reduce their environmental footprint and improve energy efficiency.

Alberta Value Added Wood Product Program Business Development Program

Right now, there is an opportunity for Alberta companies to obtain funding to research and implement innovative new products and systems. If you have some ideas to incorporate AI into your process, you should be looking to this program for potential funding.

While all of these ideas may get you excited, like anything new they have risks that must be considered. Remember Katerra, they were going to revolutionize the construction industry.

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

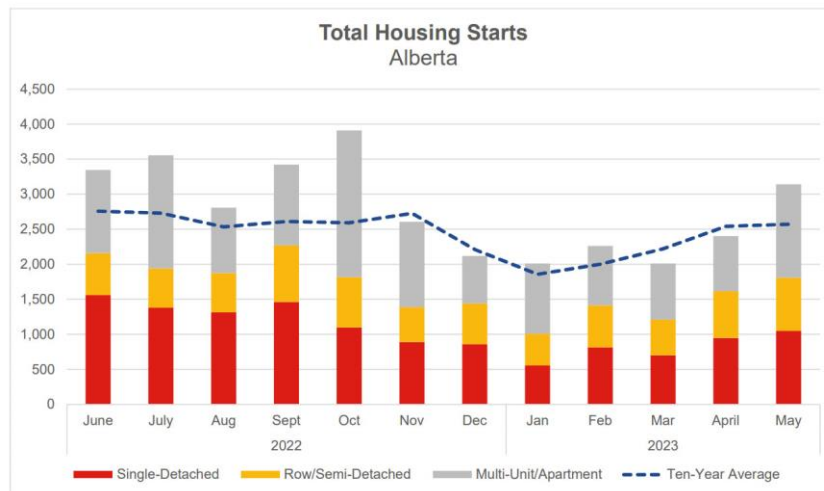
Economic Update

In Alberta, urban housing starts totaled 3141 in May 2023, a year-over-year decrease of 19.8%. Canadian housing starts decreased by 31% over the same period. Edmonton was down 51.5% compared to last May, and Calgary was up by 17%. Total starts in Alberta were up from 2404 in April of 2023.

Housing Starts Alberta						
	May-23	May-22	% Change	YTD 2023	YTD 2022	% Change
Alberta	3141	3916	-19.79%	11743	13657	-14.01%
Edmonton	858	1771	-51.55%	4112	6079	-32.36%
Calgary	2076	1769	17.35%	6867	6242	10.01%
Red Deer	27	17	58.82%	88	48	83.33%
Grande Prairie	9	29	-68.97%	32	73	-56.16%
Lethbridge	1	44	-97.73%	51	390	-86.92%
Wood Buffalo	1	21	-95.24%	9	50	-82.00%
Whitehorse*	N/A	N/A	#VALUE!	N/A	N/A	#VALUE!
Canada	15889	23062	-31.10%	80197	88843	-9.73%

*Whitehorse Starts are for the quarter, statistics are not available monthly.

Housing Starts					
	May 2023 Actual	Month to Month (%)	Year over Year (%)	Year-to-Date (%)	Ten-Year Average (%)
Total	3,141	30.8%	-18.7%	-13.3%	22.1%
Single Detached	1,047	10.4%	-22.7%	-24.1%	0.3%
Row/Semi-Detached	762	14.2%	-7.3%	2.4%	18.0%
Multi-Unit/Apartment	1,332	69.3%	-21.1%	-11.1%	50.9%



The weakness in Alberta housing starts in early 2023 is expected to be temporary, given soaring demand. It's too early to say that April marks a turnaround, but we do expect activity to pick up materially next year.

Alberta jobs are holding the line - Alberta saw a minor tick-up in employment of 3,900 in May. But more importantly, the unemployment rate actually fell 0.2 notches to 5.7%. Alberta has been outperforming Canada on year-over-year job growth since mid-2022, and so far this year employment is up an impressive 3.7%. But job gains are slowing with employment essentially flat the last two months after an upbeat first quarter.

ATB June 2023 Economic Outlook

Push and pull in the construction sector The post-COVID rebound in home construction shifted into reverse last summer amid rising interest rates, escalating building costs, and labour shortages (job vacancies have soared in the construction sector).

Residential activity has fallen the hardest, with housing starts reaching 28,000 units (annualized) in the first quarter of 2023 compared to 42,000 at the peak in the second quarter of 2022. Activity in Calgary has held up relatively well, bolstered by large population gains and a tighter resale market.

Higher interest rates and labour constraints will “pull” on activity for the remainder of 2023 and into 2024, but surging demand from record in-migration will “push.” Housing starts are currently advancing well below the estimated rate of household formation, and are forecast to improve to 37,000 units in 2024.

The rental market is facing pressures with vacancies expected to decline and rents forecast to rise. In the resale market, higher interest rates have reduced buyer’s appetites. Sales and listings have fallen from last year’s elevated levels. As a result, inventory sits at 3.3 months of supply, well below historic norms (the 20-year average is 4.9 months of supply).

Outside the residential sector, prospects are mixed. Industrial demand is strong, as Alberta offers lower rents than other provinces and industrial availability rates have fallen. The office segment has stabilized, but at high levels of vacancies. Work is underway to convert empty offices to condos.

[ATB Alberta Economic Outlook June 2023](#)

[The Fed's Inflation Fight Faces a New Challenge: A Dry Panama Canal - BNN Bloomberg](#)

Lumber

Lumber futures surged above \$550 per thousand feet, their highest since early February driven by supply disruptions and strong demand as the summer construction season approaches.

In Canada, record wildfires have ravaged approximately 4 million hectares of timber since June 6th, even before the start of the official fire season. As a result, sawmills have been forced to shut down, leading to substantial disruptions in the forestry industry.

Meanwhile, in the United States, housing starts unexpectedly jumped by 21.7% month-over-month in May, reaching a seasonally adjusted annualized rate of 1.631 million. This surge indicates a promising recovery in the housing market, which had experienced a slowdown due to factors such as high mortgage rates, elevated prices, and tighter lending conditions. The scarcity of existing homes in many markets has contributed to the growing demand for new construction, even in the face of higher interest rates.



[Canadian Wildfires Shutter Sawmills, Drive up Lumber Prices](#)

Quality Control

In the past I have talked about lumber defects such as knots and wane. The other issue we have with this imperfect material is deformation or warp, so I am going to spend the next couple of newsletters talking about that.

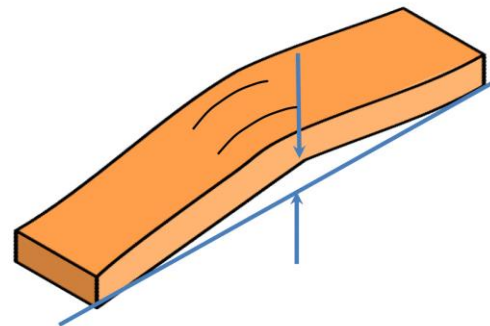
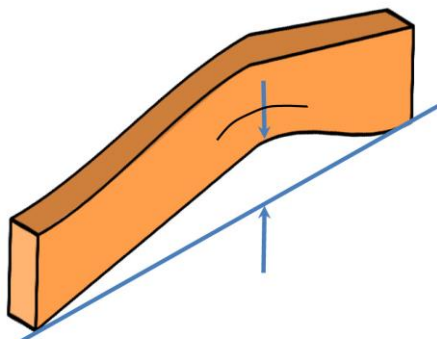
Warp

NLGA 752 describes warp as any deviation from a true or plane surface, including “Bow”, “Crook”, “Cup” and “Twist” or any combination thereof. Warp restrictions are based on the average form of warp as it occurs normally, and any variation from this average form, such as short kinks, shall be appraised according to its equivalent effect.

Crook

This is one of the most frequent defects we come across and is also confused with bow.

Crook is the edge-wise deviation of a piece of timber from a straight line from end to end, while bow is the flat-wise deviation.



CROOK		
	8'	16'
2X4	3/8"	1"
2X6	3/8"	7/8"
2X8	5/16"	3/4"

BOW		
	8'	16'
2X4	3/4"	1-1/2"
2X6	3/4"	1-1/2"
2X8	3/4"	1-1/2"

Crook is measured at the point of greatest distance from the straight line. The maximum amount of crook allowed shall be that shown in Paras. 810a, b, and c.

Now unlike lumber defects, it is common practice to limit the amount of crook to a tighter tolerance than the NLGA rules.

For example, according to NLGA 810b the allowable crook on a #2 2x4 16' long would be 2" and the WWTA guideline is a maximum of 1".

Could you imagine building a truss with a 2" crook in a 2X4?

The wider the board the less crook is allowed as you can see in the chart above.



Crook deviation looking down a board

Because we are typically building trusses so that the finished trusses are on edge, excessive crook can be a problem because the design and cutting of the lumber assumes that it is all straight. Therefore, crook makes it hard ensure that joints are tight between the webs and chords or at the splices.



The above board was rejected because it was not possible to install it and maintain a flat bottom chord.

Because trusses are typically designed to support loads from above boards with crook should be installed with the crown towards the top. This counteracts the deflection of the member when it is under load. It effectively introduces some camber into the truss, so that when it is loaded the deflection must overcome the crook.

All members deflect when loaded and if you install a top chord with the crown towards the ground, the total deflection will exceed what it normally would.

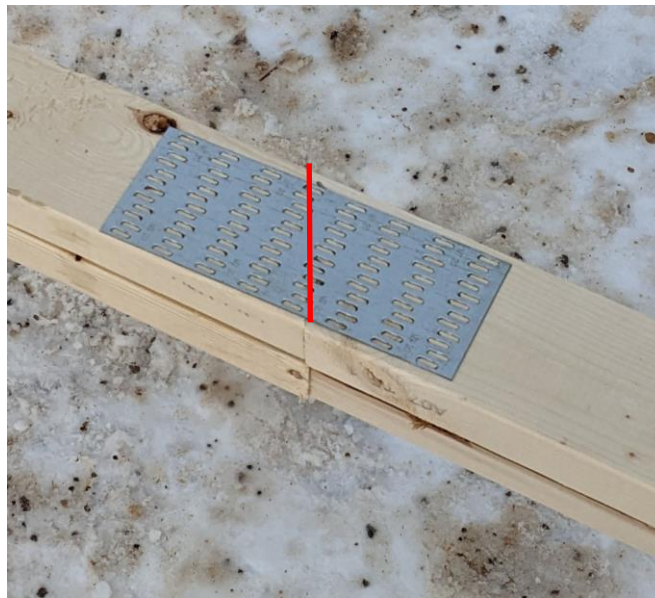


Worker checking the crook to make sure crown is up and flipping board

This brings us to the discussion on how to cut the splices on a top chord. Plumb cut or square cut? A square cut at the splice means that the cut is 90 degrees to the edge, while a plumb cut means that the cut is vertical when the truss is installed. Typically, the overhang cut is a plumb cut so that the fascia can be installed vertically.

Although it is hard with all the automated saws we have the sawyer should try to ensure that the member is cut so that the crown is towards the top of the truss in both top and bottom chords.

If you make the splice cut a plumb cut it means that the top chord can be rotated so that the builder can make sure that the crook crown is up. If one end of the top chord is plumb cut and the other square cut it can only be installed in one orientation.



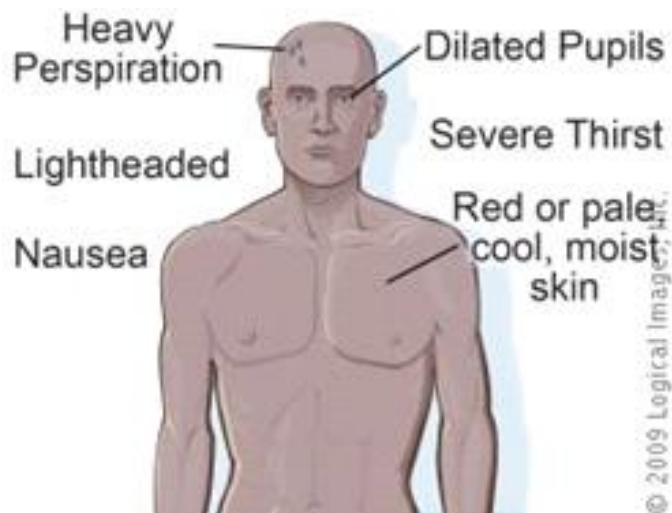
Plumb cut on a top chord

Health and Safety Toolbox

I am getting a little lazy this month, but summer is here, so it is time to talk about working in the heat again.

Working in the Heat

It is important the workers and employers review the hazards of working in heat and be able to recognize the symptoms of heat stroke.



What are the warning signs of heat stroke?

In a very hot environment, the most serious health and safety concern is heat stroke. Heat stroke can be fatal if medical attention is not available immediately. Heat exhaustion and fainting (syncope) are also types of heat related illnesses which are not fatal but can interfere with a person's ability to work.

The victims of heat stroke are unable to notice the symptoms when they are happening to themselves, and therefore, their survival depends on co-workers' ability to identify symptoms in others, and to get medical help.

While symptoms can vary from person to person, the warning signs of heat stroke can include complaints of sudden and severe fatigue, nausea, dizziness, lightheadedness, and may or may not include sweating. If a co-worker appears to be disorientated or confused (including euphoria), or has unaccountable irritability, malaise or flu-like symptoms, the worker should be moved to a cool location and get medical help immediately.

What should be done when it is very hot?

Employers have a duty to take every reasonable precaution to ensure the workplace is safe for the worker. This duty includes taking effective measures to protect workers from heat stress disorders if it is not reasonably practicable to control indoor conditions adequately, or where work is done outdoors.

Certain steps can be taken to reduce discomfort. These include:

- using fans or air conditioning
- wearing light, loose fitting clothing
- taking more frequent rest breaks
- drinking cold beverages (ones that do not have caffeine or alcohol)
- allowing flexibility to permit less physically demanding activities during peak temperature periods.
- using screens or umbrellas to create shade.

OHS Alberta has a very extensive publication on working in heat and cold and it can be viewed and downloaded at:

<https://www.alberta.ca/working-extreme-temperatures.aspx>

The Canadian Center for Occupational Health and Safety also has some good resources.

https://www.ccohs.ca/oshanswers/phys_agents/max_temp.html

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

WWTA Meeting

The Western Wood Truss Association of Alberta held our conference and annual general meeting June 8th in Canmore Alberta. There was a good attendance with 74 registered guests. There were even some spouses that came along to enjoy the mountains. We tried something a little different this year holding the meeting later and in a different location. Please let me know if you liked it or if you have any suggestions for future meetings.

The Keynote speaker was Jackie Rainforth and the topic was Rise Above the Competition: Embrace Disruption in the Post-Pandemic Era. The focus was on how to be a disruptor and taking advantage of the changes in relationships after the pandemic. Jackie did a good job making her presentation relevant to our industry and the issues we deal with. Jackie has some information for WWTA members from her presentation below.

[Jackie Rainforth WWTA](#)



The membership voted to keep the plate levy, fixed annual fee, and associate membership fee at the current levels. In addition, we decided to add an additional membership category for non-fabricating distributors such as lumber yards or other companies involved in supplying wood components.

Dave also gave an update on the development of the new STANDATA's and the progress of developing a certifying body for quality control with the Canadian Wood Truss Association.

Elected to the Board of Directors are:

- Derek Foss
- Paul Foreman
- Brent Feyter
- David Klassen, P.Eng
- Laura Barber
- Brad Cuthbertson
- Darrell Curtis
- Manfred Schmol
- Kent Drescher
- David Codrington
- Wendy Murphy

Derek Foss was elected to be the President for another 2 year term.

Alberta Value Added Wood Products Program Business Development Program Open for Applications

The Alberta Value-Added Wood Products Business Development Program has two key goals:

1. Support small/medium Alberta businesses with new product market entry by providing assistance in market analysis and market development planning.
2. Research key market opportunities, innovative new wood products/systems and examine approaches to offset risks associated with getting new products to market.

Achieving these goals is expected to have a positive impact on Alberta's economic stimulus plans, particularly in terms of generating new markets and products, creating job opportunities, and enhancing revenues for Alberta businesses. These goals are intended to help offset declining revenue and jobs within the industry and provide solutions to expand market share for Alberta's value-added wood sector products.

The Business Development Program represents a unique opportunity for value-added wood companies and their partners to receive support for research and business planning, information sharing, and the exploration of new market opportunities, wood product or system applications, and products. This initiative is expected to result in the following outcomes:

- Increased domestic demand for and use of Alberta's wood products. The grants offered under this program will address gaps in business development support and will be used to assist eligible companies to expand and develop their operations.
- Over the past decade, Alberta's value added wood product industry has experienced a decline in revenue. The grants will support education, communication and business planning activities which will benefit the industry as well as increase domestic demand for forest products produced in Alberta.
- The grants are anticipated to lead to an increase in employment opportunities within the valued added manufacturing sector. This will benefit the provincial economy and provide new job opportunities for the workforce in Alberta.

Qualifications

To qualify for support under this program, your company must be legally registered as a for-profit organization in Alberta.

In addition, your company must be considered a micro, small or medium-sized enterprise or employer with fewer than 250 employees globally for this program.

Your company must conduct business as a value-added wood product or system manufacturer in Alberta.

Your company understands and agrees to use funding obtained under this program for the identified Eligible Activities.

Examples of eligible value-added wood products and systems

- Roof trusses, laminated beams and panels (e.g., LVL, glulam, CLT, DLT, NLT)
- Off-Site, factory-built, prefabricated or modular wood frame components and buildings
- Wood walls / wall systems, and flooring / floor systems
- Wood doors and windows
- Millwork, cabinets, furniture, paneling
- Fencing, partitions, plywood

Important Dates

Call for proposals opens: May 31, 2023

Final date to submit a proposal: July 31, 2023

Proponents notified following evaluation: Late August 2023

Estimated date for completion of contract discussions and start of projects: October 1, 2023

For more information and to apply go to:

<https://avawpp.com/>

Congratulations

The Western Wood Truss Association of Alberta would like to congratulate Timber Wolf Truss for winning the Large Category Supplier of the Year award at the recent BILD Central Alberta 2023 Awards of Excellence in Housing held May 28th in Red Deer.

By the looks of the trophy shelf this is not the first win for Timber Wolf Truss.



STANDATA and Code Update

As of the date of writing this we still have no new news on the progression of the STANDATA's for metal-plate-connected trusses or Engineered Lumber Components.

There is a breakfast presentation for CHBA Edmonton the morning of June 28th by Keith Jansen who coincidentally is leading the working group for the Builders Sub-council on this file.

The presentation is titled "Learn how codes are adopted, what is up and coming in the 2022 and 2027 version of the code, and a look at Standata and Variances with speaker Keith Jansen of Lincolberg Master Builder".

The codes dates continue to be a moving target but members of CHBA Edmonton should attend to stay up to date.

<https://www.chbaedmonton.ca/events#id=165&wid=601&cid=1688>

I have not heard of any other presentations for other regions at this time, but if you are aware of any please let me know.