

## Ilka Cassidy, Steve Hessler, Single Integrated Manufacturing Model Part 2: Digital alignment, SIMM vs BIM, CLT components, light framed hp wall panels: 2021-11-02

In this evening's talk, Holzraum System's Ilka Cassidy and Steve Hessler describe how their **Single Integrated Manufacturing Model (SIMM)** process captures structural, building fabric, energy performance, manufacturing, and mechanical systems details and data prior to the cost-effective offsite manufacture of PH buildings. The SIMM's delivery of detailed drawings ensures that every aspect of their PH buildings meet client expectations.

### Summary of the Links and Product references in the chat:

- 00:13 Ian Robertson                      This is you, Tom, right? <http://www.maddenbaughman.com/>
- 00:18 Jason Carter                      Hello everyone. Do we have any offsite folks here? I am Jason Carter The Mod Coach. <https://www.themodcoach.com/>    Very excited to see what you guys are doing. I build and design new factories around the world
- 00:22 Shannon | New Hope PA USA      Follow Holzraum on Linked In: <https://www.linkedin.com/company/holzraum-system-llc/>
- 00:24 Shannon | New Hope PA USA      Connect with Steve Hessler, <https://www.linkedin.com/in/steve-hessler-81214833/>; & Ilka Cassidy, <https://www.linkedin.com/in/ilka-gronert-cassidy-a8653831/>.
- 00:24 Shannon | New Hope PA USA      <https://www.holzraumsystem.com/>
- 00:40 Shannon | New Hope PA USA      Connect with Tom :) <https://www.linkedin.com/in/tom-baughman-103b023/>
- 00:42 Shannon | New Hope PA USA      Connect with Patrick Clark @ Stolze Timber Systems <https://www.linkedin.com/in/patrick-clark-78137722/>
- 00:46 Mark Wille                      "The Client & The Contractor Relationship with Jake Bruton of Aarow Building & the unbuildit podcast and The Build Show Network is LIVE on 11/5/21 at 10 am Pacific: Please join us ~ <https://www.linkedin.com/events/theclient-thecontractorrelation6853770265038606336/> (Editor: This event has now ended.)
- 00:51 Patrick Clark-Stoltze                      <https://www.rothoblaas.com/>
- 01:05 David Hessler                      if folks have questions about the model data or what we are trying to accomplish by surfacing this data to our project teams with a webapp, please feel free to email me at david@holzraumsystem.com; <https://www.linkedin.com/in/davidhessler/>
- 01:14 Zack Semke                      Here's a link to register for Friday's virtual tour and kick off for International Passive House Days. Please join us! <https://passivehouseaccelerator.com/event-announcements/engine-16-virtual-tour-and-kick-off-of-international-passive-house-days>. (Editor: This event has now ended.)
- 01:44 Shannon | New Hope PA USA      Urban Mining Index <https://urban-mining-index.de/en/>: Defab Prefab Defab repeat
- 01:45 Patrick Clark-Stoltze                      Light Frame Prefabricator on this project: <https://collectivecarpentry.com/>
- 01:49 Michael Davis | Seattle (he/him)      Mercer International Mass Timber in Spokane WA (former Katerra Facility): <https://mercerint.com/>

01:54 Eric Reinhard RDH Building Science (<https://www.rdh.com/>) is holding an all-day symposium on mass timber enclosure systems November 16 in New England. [Learnbuildingscience.com](https://learnbuildingscience.com)

01:55 Rich Do we have a link for Crescent Tools too? <https://www.crescenttool.com/>

**For the Global audience: Abbreviations / Acronyms; Proper names; Technical Terms; and Slang used in the chat:**

**badass** – a tough, uncompromising, or intimidating person or attitude.

**BIM** – **B**uilding **I**nformation **M**odelling - a building design, construction planning, and lifecycle management system based upon the collaborative generation of 3D digital designs; interim and final drawings; analysis, documentation, and management of all the physical and functional attributes of a building, and the installation, running, and maintenance of its plant and equipment. (<https://bimvision.eu/about/>)

**#BOOM** - An exclamation used to draw attention to (or to praise) an excellent idea or result. For added emphasis, the speaker may use one hand to imitate something being quickly and forcefully thrown down.

**CADD** - **C**omputer **A**ided **D**esign and **D**rafting: software used to create 2-D and 3-D drawings and plans for architecture, mechanical engineering, and other purposes. (<https://www.autodesk.com.au/solutions/cad-software>)

**CadWork** – A proprietary 3-D design software for timber construction, framing, and carpentry. (<https://www.cadwork.com/cwen/Home>)

**CAM** – **C**omputer **A**ided **M**anufacturing: 3-D design software which guides CNCs in the automatic shaping of raw materials into precisely formed products; CAM software interprets CADD drawings for use by CNC machines.

**change orders** – contract variations or amendments, agreed to by both contractor and client, altering the original scope of work.

**CLT** – **C**ross-**L**aminated **T**imber – an engineered, structural, solid wood product; within each layer, the wood grain runs in a single direction; when laminated together, the grain of each layer runs at right angles to that of the previous layer; similar to plywood but with much thicker layers.

**CLT beams** – structural beams made from CLT

**CNC** – **C**omputer **N**umerical **C**ontrol machines – machines guided by CAM software to shape raw wood, metal, or plastics into precisely formed products; typically, CNCs are automated routers, lathes, or milling machines; lasers, plasma torch, electrical discharge, or high-pressure water cutters; or 3-D printers.

**c u l8tr!** – phonetic abbreviation for 'See you later!'

**defab** – to **de-fabricate**, unbuild, or take apart for the purpose of re-using materials.

**dig / digging** – appreciate / appreciating.

**geek** – an intellectually gifted person obsessed with complex technical or technological ideas, objects, or processes.

**Glulam** – **G**lue-**L**aminated **T**imber – solid structural engineered wood, generally long, made from parallel-grained bonded timber laminates glued together with polyurethane adhesive or other modern resins.

**GLTNG** - **G**lue **L**aminated **T**ongue and **G**roove – Glulam shaped with tongue-and-groove edges for smooth assembly.

**hp** – high performance

**Holtzraum Catch** – Holzraum System's proprietary software for the accumulation, presentation, and use of SIMM data. (<https://www.holzraumssystem.com/>)

**icky and ew** – expressions of disgust; indicating here extreme reluctance to go out on a dark and rainy night.

**IPD - Integrated Project Delivery** – collaborative project management, integrating people, systems, and business structures and practices to harness all participants’ knowledge, talents, and insights, thereby optimizing project value, efficiency, and results while reducing waste during all phases of design, fabrication, and construction.

**Kool Aid** - an American powdered drink mix; based on the 1978 Jonestown massacre, a reference to Kool-Aid indicates accepting an idea due to overwhelming persuasion. (<https://en.wikipedia.org/wiki/Kool-Aid>).

**KVH – Konstruktionsvollholz** - solid structural timbers typically made from lengths of kiln-dried, finger-jointed, insect-resistant fir, larch, spruce, or pine, glued together for use as load-bearing components in timber construction. (<https://www.holzland.de/konstruktionsvollholz/>)

**LCA – Life Cycle Assessment** - an internationally accepted scientific method used to quantify the embodied carbon and other environmental impacts of buildings.

**Lincoln Logs** – A wooden building toy: miniature logs of varying lengths with regularly-spaced square notches on their upper and lower surface. Logs could be interlocked at right angles to form log cabin walls. Named for US President Abraham Lincoln, said to have been born in a log cabin.

**LOL** – laugh out loud

**material quantity takeoff schedule** – a complete list, generated by BIM or CADD software, of all the materials to be used in a construction project, including their dimensions, costs, and locations in the finished building.

**Minotair** – a proprietary brand of PH-suitable ventilation equipment; Minotair is a founding sponsor of the Passive House Accelerator website. ([https://www.minotair.com/home\\_en/](https://www.minotair.com/home_en/))

**ON** – Ontario.

**platform frame vs balloon frame** – platform framed wall studs extend the height of one storey only, separated by the ceiling from successive storeys; in balloon framed walls, timber studs extend from the foundation to the roof.

**Prefab** – to pre-fabricate or build offsite.

**Revit** – A proprietary brand of BIM software. (<https://www.autodesk.com.au/>)

**ROM pricing** – Rough Order of Magnitude: an imprecise estimate for the costs of goods or services; a ROM estimate will not include all final cost elements (e.g. labour, travel and transport, special licenses, extra equipment, etc.).

**SIMM - Single Integrated Manufacturing Model**: a process whereby building design information is compiled to produce detailed data sets and 3-D drawings of a building’s structural, building fabric, energy performance, manufacturing, and mechanical systems for analysis and confirmation by all designers and stakeholders prior to the efficient offsite production of pre-fabricated building elements. (<https://www.holzraumsystem.com/s-i-m-m>)

**tongue-and-groove** – Ridges (the tongues) and channels (the grooves) carved along alternate sides or edges of the lengths of wooden boards or panels. Designed to interlock, they are used to fit adjacent pieces of wood together.

**went down a rabbit hole** – spent more time than intended following an idea, project, or situation that became more detailed, chaotic, or bizarre than originally anticipated; from Lewis Carroll’s book, *Alice in Wonderland*.

**The chat:** (Note: time signatures refer to Zoom call length)

00:05 Hans Eich   SIGA	Shaun, you didn’t visit me when you were in ON, now I’m in BC. Coming for you lol
00:09 Peter Molenaar   CPHT	CADworks is great
00:10 Shannon   New Hope PA USA	Nice shirt Mark!

00:13 Ian Robertson	This is you Tom, right? <a href="http://www.maddenbaughman.com">http://www.maddenbaughman.com</a>
00:14 Patrick Clark-Stoltze	yes that is Tom's website
00:14 Shannon   New Hope PA USA	Welcome Everyone!
00:15 Alex De Gagné / Minotair	Hello all!
00:17 Zack Semke	Hi Alex!
00:18 Jason Carter	Hello everyone. Do we have any offsite folks here I am Jason Carter, The Mod Coach. <a href="http://www.themodcaoh.com">www.themodcaoh.com</a> Very excited to see what you guys are doing. I build and design new factories around the world
00:19 Zack Semke	Thanks for joining us, Jason!
00:20 Jason Carter	New ones will be Net Zero and products we are building are going to be net zero as well
00:21 Mark Wille	Thank YOU all for being here tonight.
00:22 Shannon   New Hope PA USA	Follow Holzraum on Linked In: <a href="https://www.linkedin.com/company/holzraum-system-llc/">https://www.linkedin.com/company/holzraum-system-llc/</a>
00:22 Reid Rowlands	I like the architects name:-)
00:23 Shannon   New Hope PA USA	@ Reid sounds familiar ;)
00:24 Shannon   New Hope PA USA	Connect with Steve Hessler, <a href="https://www.linkedin.com/in/steve-hessler-81214833/">https://www.linkedin.com/in/steve-hessler-81214833/</a> ; & Ilka Cassidy, <a href="https://www.linkedin.com/in/ilka-gronert-cassidy-a8653831/">https://www.linkedin.com/in/ilka-gronert-cassidy-a8653831/</a>
00:24 Shannon   New Hope PA USA	<a href="https://www.holzraumsystem.com/">https://www.holzraumsystem.com/</a>
00:25 Shannon   New Hope PA USA	I know that guy!
00:28 Shannon   New Hope PA USA	Wow an excavation contractor that supplies a 3d site!
00:29 Bob in Chicago	The load path is probably the coolest part of a plan I would hope for. Normally the framer has to imagine the layout.
00:29 Shaun St-Amour @ Vancouver	Sustainable Lego for adults!
00:30 Shannon   New Hope PA USA	Circular use and reuse of every part of the building defab prefab defab & repeat!
00:30 Shannon   New Hope PA USA	Great presentation ILKA!
00:31 Shannon   New Hope PA USA	@Ian the lower left ones look familiar!
00:32 Ian Robertson	@Shannon ... GLTNG (Glue Laminated Tongue and Groove) for the win!
00:33 Shannon   New Hope PA USA	Am I remembering right you had something near a 36' clear span?
00:35 Shannon   New Hope PA USA	Great explanation PAT thank you!
00:36 Shannon   New Hope PA USA	Steve wins for most tabs ;)
00:37 Mark Wille	A M A Z I N G
00:37 Shannon   New Hope PA USA	True digital Twin
00:38 Shaun St-Amour @ Vancouver	Integrated Design Process at its best, right here! WOW
00:39 Mark Wille	If Lincoln Logs came out today they would be perfect for SIMM.

00:39 Shannon   New Hope PA USA	Great Navigating Steve!
00:40 Shannon   New Hope PA USA	Connect with Tom :) <a href="https://www.linkedin.com/in/tom-baughman-103b023/">https://www.linkedin.com/in/tom-baughman-103b023/</a>
00:40 Peter Molenaar   CPHT	I've pulled apart a few roof systems, sometimes three layers at a time. :-)
00:42 Will Pritikin	+1 IPD for residential!
00:42 Shannon   New Hope PA USA	Connect with Patrick Clark @ Stolze Timber Systems <a href="https://www.linkedin.com/in/patrick-clark-78137722/">https://www.linkedin.com/in/patrick-clark-78137722/</a>
00:44 Shannon   New Hope PA USA	SIMM = the new Kool Aid
00:45 Shannon   New Hope PA USA	PHantastic Tom! Thank you
00:46 Mark Wille	"The Client & The Contractor Relationship with Jake Bruton of AArow Building & the unbuildit podcast and The Build Show Network is LIVE on 11/5/21 at 10 am Pacific: Please join us ~ <a href="https://www.linkedin.com/events/theclient-thecontractorrelation6853770265038606336/">https://www.linkedin.com/events/theclient-thecontractorrelation6853770265038606336/</a>
00:46 jeff spiritos	It seems like there are a lot of parties involved in the design. Who's got design responsibility and how's the cost for this group working out? Seems like there would be a premium for the extra participants.
00:47 Shannon   New Hope PA USA	Thermally Decoupled Roof Panels 160#/ft w/ 3'-0" overhangs
00:47 JJ	are there gutters on the end of the 3ft overhang?
00:47 Mark Wille	"well you know we kinda took it up a notch"
00:47 Shannon   New Hope PA USA	Good question JJ I'll add your question to the queue
00:49 Mark Wille	a wood fiber sandwich #PHorgetaboutit
00:49 Shannon   New Hope PA USA	KVH (Konstruktionsvollholz) is solid structural timber typically made from spruce softwood and used in modern timber construction.
00:50 Bob in Chicago	Phookin Phabulous
00:51 Patrick Clark-Stoltze	<a href="https://www.rothoblaas.com/">https://www.rothoblaas.com/</a>
00:51 Shannon   New Hope PA USA	Data attached PHasteners.... I've died and gone to geek heaven
00:51 Brian Keech in Pittsburgh	Are there many contractors and engineers "on board" with the SIMM software? And, like with Revit, can you export to CADD for engineers and consultants who are still on CADD?
00:52 Shannon   New Hope PA USA	Good Q Brian ~ got it :)
00:52 Patrick Clark-Stoltze	SIMM is a process and not necessarily a software, although the "CATCH" concept is their software
00:52 Shannon   New Hope PA USA	"We can't have the screws, screw us"
00:52 Shaun St-Amour @ Vancouver	t-shirt - don't let your screws screw you
00:53 Shaun St-Amour @ Vancouver	steve and pat went down a rabbit hole, glad they came back out
00:53 Peter Molenaar   CPHT	@Steve: a great idea to use placeholder images for simplicity!
00:54 Michael Ingui Brooklyn	Beautiful
00:54 Shannon   New Hope PA USA	(BeautiPHul)
00:55 Peter Molenaar   CPHT	PHabulous rooPH layout !
00:56 Peter Molenaar   CPHT	comPHortable PHlooring

00:57 Reid Rowlands	If anybody can do it Collective Carpentry can
00:57 jeff spiritos	Looks like all panelized walls are platform framed (not balloon frame), right?
00:58 Shannon   New Hope PA USA	What does the SIMM model say to Steve Hessler? A: You complete me :)
00:58 Michael Ingui Brooklyn	I am in love
00:58 Alex De Gagné / Minotair	indeed!
00:58 Scott Kennedy Vancouver	Q What is the time commitment for the 3D modelling?
01:00 Bob in Chicago	I'm still digging the structural layout. It's badass
01:00 David Hessler	don't have audio here
01:01 Shannon   New Hope PA USA	Thx David ~ We'll miss having your live comments but PHeel Phree to type in your thoughts to share with everyone
01:01 Shaun St-Amour @ Vancouver	Big thanks David, impressive work
01:02 Shaun St-Amour @ Vancouver	Thank you for coming out of retirement
01:04 Ian Robertson	This is so cool ... I'll need to follow the rest in the video because its rainy (dark and icky and ew) trail run time! Yay!
01:04 Zack Semke	Have fun, Ian!
01:04 Shannon   New Hope PA USA	Run PHast Ian c u l8tr!
01:04 Shaun St-Amour @ Vancouver	stay safe Ian
01:05 David Hessler	if folks have questions about the model data or what we are trying to accomplish by surfacing this data to our project teams with a webapp, please feel free to email me at david@holzraumsystem.com
01:07 Sean Borman	Are the custom CLT beams made using CAM?
01:07 Vlad @ Boston	Are KVH imported, or there is a manufacturer also here in North America?
01:07 Michael Davis   Seattle (he/him)	I'd love to have them back when they are under construction.
01:08 Shannon   New Hope PA USA	Circular use and reuse of every part of the building: defab prefab defab & repeat!
01:09 Shannon   New Hope PA USA	@Michael Davis ~ Agreed
01:10 Michael Davis   Seattle (he/him)	Thank you Steve and Ilka, amazing project/process!
01:11 Alex De Gagné / Minotair	Wunderbar Ilka and Steve!
01:12 Ilka Cassidy	Danke schoen, Alex!
01:14 Zack Semke	Here's a link to register for Friday's virtual tour and kick off for International Passive House Days. Please join us! <a href="https://passivehouseaccelerator.com/event-announcements/engine-16-virtual-tour-and-kick-off-of-international-passive-house-days">https://passivehouseaccelerator.com/event-announcements/engine-16-virtual-tour-and-kick-off-of-international-passive-house-days</a>
01:14 Zack Semke	Alex, thank you for Minotair's support!
01:15 Mark Wille:	#digitaldocuments
01:16 Alex De Gagné / Minotair	Glad and proud to be part of the movement Zack!
01:17 Reid Rowlands	Minotair is such a great PH product

01:17 Michael Davis   Seattle (he/him)	I'm curious as to how this process integrates with the permitting? Does this fall into means and methods?
01:18 Alex De Gagné / Minotair	@Reid Rowlands: thanks for your support!
01:18 Scott Kosmecki	Permitting has a 2d standard language to submit projects with.
01:19 Shannon   New Hope PA USA Boston; Michael Davis	Next questions from: Scott Kennedy Vancouver; Sean Borman; Vlad @
01:21 Mark Wille	Value Added > Quality Lost and Do Overs
01:22 Shannon   New Hope PA USA	& no substitutions or change orders
01:24 Shaun St-Amour @ Vancouver	what are the costs of change orders on a project?
01:24 Mark Wille	#PHorgetaboutit
01:25 Shannon   New Hope PA USA	Sean is asking "Are the custom CLT beams made using CAM?
01:28 JJ	Are the panels rated for wind force?
01:29 Shannon   New Hope PA USA	More Value not less data
01:29 Peter Molenaar   CPHT	Q: does the Holtzraum Catch or CADwork software provide you with a material quantity takeoff schedule?
01:32 Alex De Gagné / Minotair	Congratulations all: once again some great passionate people out there pushing the PH envelope! Good night to you all!
01:32 Shaun St-Amour @ Vancouver	Goodnight Alex
01:32 Shannon   New Hope PA USA	Sweet Dreams Alex!
01:33 Shannon   New Hope PA USA	#BOOM
01:35 Bob in Chicago	Vapor open .... Awesome completely healthy ALWAYS.
01:35 Scott Kosmecki	awesome! Thank you everyone!
01:35 Shaun St-Amour @ Vancouver	Goodnight Scott
01:39 Sean Borman already :-)	LOL! I was going ask about LCA too but felt I had monopolized enough time
01:40 Patrick Clark-Stoltze Residential construction	Mass timber is not just for Timber Towers!! 75% of European CLT is used in
01:41 Shannon   New Hope PA USA	@Pat ~ That's so much bigger than I thought thank you!
01:41 Holzraum System	Peter, we can do deliver various levels of material takeoffs when it adds value to the client. one area we are focusing re: takeoffs is early ROM pricing of panelization from specific manufacturing partners so that the design and build team can determine early if that approach is feasible
01:42 Patrick Clark-Stoltze presentation!!	so excited to see the 2nd generation of the Hessler family on this
01:42 jeff spiritos and Ilka, Steve and the Team.	Great presentation. Great process. Thank you PHA and Construction tech Wishing you a smooth install experience. Goodnight all
01:42 Shaun St-Amour @ Vancouver	me to Patrick. Night Jeff.
01:42 Holzraum System	me too

01:42 Shannon   New Hope PA USA	Goodnite Jeff!
01:44 Shannon   New Hope PA USA repeat	Urban Mining Index <a href="https://urban-mining-index.de/en/">https://urban-mining-index.de/en/</a> : Defab Prefab Defab
01:45 Michael Davis   Seattle (he/him)	Great! disassembly instructions! Thinking ahead!
01:45 Patrick Clark-Stoltze	Light Frame Prefabricator on this project: <a href="https://collectivecarpentry.com/">https://collectivecarpentry.com/</a>
01:46 Peter Molenaar   CPHT	The decision to use removable fasteners is a strong consideration for deconstruction. Keep in mind the value of shear strength vs ease of removal.
01:46 Sean Borman	It's insane that we have to import CLT from Europe. Last time I checked we still have forests, sawmills, and manufacturing here in the US. Looking forward to having local manufacturers Let's go Stoltze! More suppliers, more choices, more economical to use in projects.
01:47 Shannon   New Hope PA USA	Pat how about spans for GLTNG Glue Laminated Tongue and Groove
01:49 JJ	Great presentation. thank you.
01:49 Michael Davis   Seattle (he/him)	Mercer International Mass Timber in Spokane WA (former Kattera Facility)
01:50 Shaun St-Amour @ Vancouver	Thanks for the update @Michael
01:51 Sean Borman	In an earlier presentation there was also a good discussion on designing for serviceability / maintainability. Being able to take the building assembly apart non-destructively would be a huge win.
01:52 buckmoorhead	Excellent presentation and discussion!
01:52 Michael Davis   Seattle (he/him)	Thank you all, I'm new here, and really enjoying these amazing and informative presentations!
01:53 John	Thanks for another great, inspiring session.
01:53 buckmoorhead	Thank you all
01:54 Holzraum System much.	Super grateful for the opportunity to hang out with you all! Thank you so much.
01:54 Eric Reinhard	RDH Building Science (RDH.com) is holding an all-day symposium on mass timber enclosure systems November 16 in New England. <a href="http://Learnbuildingscience.com">Learnbuildingscience.com</a>
01:55 Shannon   New Hope PA USA tonight!	Thanks to Steve Ilka Tom & Patrick & everyone for the great questions
01:55 Rich	Do we have a link for Crescent Tools too?
01:56 Sean Borman	Thanks everyone. Great presentation.
01:56 Moe	I'm always inspired listening to these specific presenters.
01:56 NEST design build everyone	Very satisfying thing you guys are doing :) Super awesome - thanks to
01:57 Cara	Thank you all
01:58 Rich	Great work!!!
01:59 Eric Reinhard	Awesome show tonight! Thanks ;-)
01:59 Peter Molenaar   CPHT	TeriPHPHic presentation! Thank you
01:59 Shannon   New Hope PA USA	See you all next week