# Webinar

**Terwilliger Center Monthly Webinar: Construction Innovation**

Date: July 16, 2021

**00:00:00 --> 00:00:03:** OK, good afternoon all and welcome to your light worker
**00:00:03 --> 00:00:05:** centers monthly webinar today.
**00:00:05 --> 00:00:08:** Our speakers will be covering construction innovation and I will
**00:00:08 --> 00:00:10:** hit it over to them in one moment.
**00:00:10 --> 00:00:13:** Just a few housekeeping items we are recording this webinar
**00:00:14 --> 00:00:16:** and it will be available after we will share it
**00:00:16 --> 00:00:17:** on knowledge Finder,
**00:00:17 --> 00:00:21:** but I will also email it to all attendees.
**00:00:21 --> 00:00:24:** And we will have time for Q&A.
**00:00:24 --> 00:00:26:** Probably around 2:45 to 4245,
**00:00:26 --> 00:00:29:** so as questions arise, please feel free to put them
**00:00:29 --> 00:00:32:** in the Q&A box and I will monitor those and
**00:00:32 --> 00:00:34:** pass them over to our panelists.
**00:00:34 --> 00:00:36:** So over to you. Mark,
**00:00:36 --> 00:00:38:** thanks. Thanks
**00:00:38 --> 00:00:41:** Rosie. So I'm Mark Oberholtzer,
**00:00:41 --> 00:00:46:** architect with KTGY out of the downtown LA office and
**00:00:46 --> 00:00:48:** very involved in mixed use,
**00:00:48 --> 00:00:51:** urban infill projects and also,
**00:00:51 --> 00:00:55:** you know very much interested in in different construction,
**00:00:55 --> 00:00:58:** typology's and and and their uh,
**00:00:58 --> 00:01:02:** their guess opportunities for design joining me.
**00:01:02 --> 00:01:07:** We've got David Edmondson from CW driver at they want
**00:01:07 --> 00:01:08:** to introduce.
**00:01:08 --> 00:01:09:** Yourself
**00:01:09 --> 00:01:12:** thanks mark. My name is David Hamilton,
**00:01:12 --> 00:01:16:** project executive for CD Driver CD Driver is 102 year
**00:01:16 --> 00:01:19:** old company in Southern California.

**00:01:19 --> 00:01:23:** For me personally, 26 years in the business and.
**00:01:23 --> 00:01:26:** Have really touched just about every industry.
**00:01:26 --> 00:01:29:** We have a pretty large focus on moving the volumetric
**00:01:29 --> 00:01:34:** modular projects forward and have a couple projects moving forward
**00:01:34 --> 00:01:37:** with Mark and really excited to to like Mark said
**00:01:37 --> 00:01:41:** to on on this new adventure of and I don't.
**00:01:41 --> 00:01:44:** I guess it's not so new but newer for for
**00:01:44 --> 00:01:45:** CW driver,
**00:01:45 --> 00:01:49:** but on the volumetric modular projects and also joining the
**00:01:49 --> 00:01:51:** team is a structural engineer.
**00:01:51 --> 00:01:51:** Matt timmers.
**00:01:53 --> 00:01:56:** I am at Timmers on the stretch function ear with
**00:01:56 --> 00:01:58:** Johnny Martin and Associates are offices in LL.
**00:01:58 --> 00:02:00:** We have an office in Oakland,
**00:02:00 --> 00:02:03:** CA as well. Like Mark and David,
**00:02:03 --> 00:02:06:** very interested in innovative construction techniques,
**00:02:06 --> 00:02:09:** including modular mass, timber, precast paralyzed metal studs.
**00:02:09 --> 00:02:13:** So happy to share our experience with you today.
**00:02:13 --> 00:02:13:** Thank you.
**00:02:16 --> 00:02:16:** And
**00:02:16 --> 00:02:20:** I'm going to share my screen where if you have
**00:02:20 --> 00:02:20:** questions,
**00:02:20 --> 00:02:23:** we're going to have a Q&A at,
**00:02:23 --> 00:02:27:** like in 40 minutes. But meanwhile you can be populating
**00:02:27 --> 00:02:31:** the chat with those and we'll be looking at him
**00:02:31 --> 00:02:34:** as a group and and hit as many as we
**00:02:34 --> 00:02:36:** can. We've got this and,
**00:02:36 --> 00:02:37:** and Matt alluded to it,
**00:02:37 --> 00:02:40:** we've got this presentation, which we're going to,
**00:02:40 --> 00:02:43:** you know, kind of flipped through.
**00:02:43 --> 00:02:45:** Covering for modular, panelization, mass timber.
**00:02:45 --> 00:02:49:** And also structural precast and kind of and with kind
**00:02:49 --> 00:02:52:** of pros and cons state of the art and what
**00:02:52 --> 00:02:54:** we're seeing in each of these areas.
**00:02:54 --> 00:02:57:** And I think I think the three of us would
**00:02:57 --> 00:03:00:** agree that there's a multiplicity of technologies,
**00:03:00 --> 00:03:02:** some of them are new,
**00:03:02 --> 00:03:03:** some of them are older,
**00:03:03 --> 00:03:06:** they are in different states of development.
**00:03:06 --> 00:03:09:** But what we're hoping to do is show you what
**00:03:09 --> 00:03:13:** we're working on and and give you some insight into

**00:03:13 --> 00:03:15:** when it makes sense to consider.
**00:03:15 --> 00:03:19:** Going in a direction that uses one of these innovative
**00:03:19 --> 00:03:19:** technologies.
**00:03:19 --> 00:03:23:** So the first one of these is modular biometric modular,
**00:03:23 --> 00:03:26:** and there is wood and steel and and you know
**00:03:26 --> 00:03:28:** we're not so much describing the basics,
**00:03:28 --> 00:03:30:** 'cause I feel like you know.
**00:03:30 --> 00:03:32:** Probably many people know it,
**00:03:32 --> 00:03:34:** but kind of trying to dig into a little bit
**00:03:34 --> 00:03:38:** more of the experience right and this this project here
**00:03:38 --> 00:03:39:** was that,
**00:03:39 --> 00:03:42:** at least for me, the first steel modular project in
**00:03:42 --> 00:03:43:** Westlake in LA.
**00:03:43 --> 00:03:44:** Permanent supportive housing, but really,
**00:03:44 --> 00:03:47:** that has led to over the last five years for
**00:03:48 --> 00:03:51:** us with a whole bunch of different partners.
**00:03:51 --> 00:03:54:** Working on a number of steel modular projects,
**00:03:54 --> 00:03:57:** hospitality projects. Perfect fit. You know.
**00:03:57 --> 00:04:01:** Site built versus the modular rooms kind of closed the
**00:04:01 --> 00:04:02:** door.
**00:04:02 --> 00:04:05:** All the finishes come in there.
**00:04:05 --> 00:04:09:** What we've seen, interestingly, is a real evolution in in
**00:04:09 --> 00:04:14:** manufacturers and delivery methods and a greater understanding of the
**00:04:14 --> 00:04:15:** logistics and and Dave,
**00:04:15 --> 00:04:18:** I wanted to ask you,
**00:04:18 --> 00:04:22:** you know, could you talk a little bit about the
**00:04:22 --> 00:04:24:** effective logistics?
**00:04:24 --> 00:04:27:** As a effects of modular feasibility for project,
**00:04:27 --> 00:04:27:** yeah
**00:04:27 --> 00:04:30:** I think I I was gonna say before you asked
**00:04:30 --> 00:04:34:** me the question that I think there's a fear.
**00:04:34 --> 00:04:37:** A little bit of volumetric modular that it's a some
**00:04:37 --> 00:04:38:** new technology,
**00:04:38 --> 00:04:41:** but it really isn't new IT might be newer to
**00:04:41 --> 00:04:42:** the United States,
**00:04:42 --> 00:04:46:** but it's been. It's been pretty well used outside of
**00:04:46 --> 00:04:48:** the US and and it's quite.
**00:04:48 --> 00:04:51:** There's quite a few projects going on currently as it
**00:04:52 --> 00:04:54:** relates to logistics I I think.
**00:04:54 --> 00:04:57:** There's a it the the the simple part is you
**00:04:57 --> 00:04:58:** have.

**00:04:58 --> 00:05:00:** You need a lot less space.
**00:05:00 --> 00:05:05:** Uhm? But you do need space for a crane.
**00:05:05 --> 00:05:08:** You do need space for lay down of modular units,
**00:05:08 --> 00:05:10:** whether they be a, uh,
**00:05:10 --> 00:05:13:** we you know we like to do just in time
**00:05:13 --> 00:05:14:** delivery.
**00:05:14 --> 00:05:17:** But as you know, depending on how far your trucking,
**00:05:17 --> 00:05:21:** there's some modular manufacturers that are around the United States.
**00:05:21 --> 00:05:23:** There's some in Canada, there's some overseas,
**00:05:23 --> 00:05:26:** so depending on where you're getting them,
**00:05:26 --> 00:05:28:** there is a local manufacturer here in California,
**00:05:28 --> 00:05:32:** and so we can get them within a couple hours.
**00:05:32 --> 00:05:35:** There's another one in in Texas that we can get
**00:05:35 --> 00:05:37:** him in Southern California the next day,
**00:05:37 --> 00:05:40:** so those kind of where we're not looking to build
**00:05:40 --> 00:05:41:** yards to store.
**00:05:41 --> 00:05:43:** But if you're getting them from China,
**00:05:43 --> 00:05:46:** you're going to need a storage yard to store all
**00:05:47 --> 00:05:48:** those boxes ahead of time.
**00:05:48 --> 00:05:51:** 'cause they're going to need to come in and be
**00:05:51 --> 00:05:52:** trucked to the site.
**00:05:52 --> 00:05:54:** So you're you're taking them off a truck and putting
**00:05:54 --> 00:05:55:** them on.
**00:05:55 --> 00:05:57:** It's on the building 'cause you can put.
**00:05:57 --> 00:06:03:** You know, tend to. 1010 units plus 10/15 a day.
**00:06:03 --> 00:06:04:** And so they go pretty fast.
**00:06:04 --> 00:06:07:** So when you're talking about a building of this size
**00:06:07 --> 00:06:08:** within a couple months,
**00:06:08 --> 00:06:11:** you your buildings erected after after you get the podium
**00:06:11 --> 00:06:11:** built.
**00:06:13 --> 00:06:17:** And I think one thing that you know.
**00:06:17 --> 00:06:21:** One thing that this this particular hotel project speaks to
**00:06:21 --> 00:06:21:** is also,
**00:06:21 --> 00:06:23:** and this is true I think,
**00:06:23 --> 00:06:26:** and Matt correct me if if this in the case,
**00:06:26 --> 00:06:29:** but really all of these typologie's we have.
**00:06:29 --> 00:06:31:** Yeah you can use them low rise,
**00:06:31 --> 00:06:34:** but they do. They do offer a pathway to sorta
**00:06:34 --> 00:06:36:** mid rise and that particularly I mean,
**00:06:36 --> 00:06:39:** all of us are the three of us are in
**00:06:39 --> 00:06:43:** California and a lot of the work is in LA

**00:06:43 --> 00:06:44:** and and that has,
**00:06:44 --> 00:06:47:** you know, has a need for mid rise with given
**00:06:47 --> 00:06:48:** the.
**00:06:48 --> 00:06:51:** Sort of regulatory environment encouraging density in infill sites,
**00:06:51 --> 00:06:56:** but but without projects, always being able to take the
**00:06:56 --> 00:07:00:** costs of a concrete precast concrete type one structure or
**00:07:00 --> 00:07:02:** some kind of steel,
**00:07:02 --> 00:07:04:** you know, red iron steel,
**00:07:04 --> 00:07:07:** so you know this project is low rise.
**00:07:07 --> 00:07:11:** Hope on Alvarado, it's really the first one that we
**00:07:12 --> 00:07:12:** did.
**00:07:12 --> 00:07:16:** It finished and you know truthfully it took longer than
**00:07:16 --> 00:07:18:** a typical podium because.
**00:07:18 --> 00:07:21:** We kind of learned by doing and the we is
**00:07:21 --> 00:07:22:** the manufacturer,
**00:07:22 --> 00:07:25:** the contractor, the architects and all the consultants.
**00:07:25 --> 00:07:28:** I think that we had a different engineer for the
**00:07:29 --> 00:07:32:** modular versus the site built right and and Matt I
**00:07:32 --> 00:07:35:** I wanna know what you think about that.
**00:07:35 --> 00:07:38:** We think it's a mistake to have separate engineers.
**00:07:40 --> 00:07:42:** Like you always want to create a collaborative environment,
**00:07:42 --> 00:07:45:** but it's not always possible when you have different elements
**00:07:45 --> 00:07:46:** and you know sometimes egos,
**00:07:46 --> 00:07:49:** do get in the way and fortunately and when really
**00:07:49 --> 00:07:51:** you want to reach across that island,
**00:07:51 --> 00:07:54:** bridge the gap and ultimately build the best building as
**00:07:54 --> 00:07:56:** quickly as you can with the team you have.
**00:07:58 --> 00:08:00:** I think that this, you know,
**00:08:00 --> 00:08:02:** Speaking of teams in this project,
**00:08:02 --> 00:08:05:** like I said, was a learning experience.
**00:08:05 --> 00:08:08:** These three same team or variations of the team are
**00:08:08 --> 00:08:12:** with the exception of the general contractors are under construction
**00:08:12 --> 00:08:15:** simultaneously and and see to be driver is building hope
**00:08:15 --> 00:08:18:** on Hyde Park. Another one of these so it kind
**00:08:18 --> 00:08:20:** of went from the slides
**00:08:20 --> 00:08:24:** a little bigger. Jackson gosh yeah,
**00:08:24 --> 00:08:28:** I sure can. And and and this is kind of
**00:08:28 --> 00:08:31:** a a little bit of a hey,
**00:08:31 --> 00:08:35:** this worked. We learned lessons and were were applying.
**00:08:35 --> 00:08:37:** Unlike most things you learn in life,
**00:08:37 --> 00:08:42:** you get were really applying those lessons and trying to

**00:08:42 --> 00:08:44:** profit by them so.
**00:08:44 --> 00:08:47:** Let me go there. I hope that helps a little
**00:08:47 --> 00:08:48:** bit better.
**00:08:48 --> 00:08:51:** So this is the one that CW driver is building
**00:08:51 --> 00:08:52:** right?
**00:08:52 --> 00:08:55:** And and could you comment a little bit?
**00:08:55 --> 00:08:58:** Dave on the the the where the manufacturer plugs in
**00:08:58 --> 00:08:59:** at
**00:08:59 --> 00:09:02:** what point typically, so our recommendation is.
**00:09:02 --> 00:09:05:** You hire A or. When I say you,
**00:09:05 --> 00:09:07:** I mean the developer hires an architect,
**00:09:07 --> 00:09:11:** hires a general contractor and hires the modular supplier at
**00:09:11 --> 00:09:12:** the same time.
**00:09:12 --> 00:09:14:** I think there's a value in bringing us all in
**00:09:14 --> 00:09:16:** together to collaborate.
**00:09:16 --> 00:09:19:** I think probably the message I was going to give
**00:09:19 --> 00:09:21:** in this whole presentation.
**00:09:21 --> 00:09:24:** My whole thought is you're shifting some of that mentality
**00:09:25 --> 00:09:26:** of we get it partially designed,
**00:09:26 --> 00:09:30:** will figure it out in the field.
**00:09:30 --> 00:09:35:** 2. We need to do a lot more collaboration in
**00:09:35 --> 00:09:39:** design and figuring it all out up front.
**00:09:39 --> 00:09:42:** What that means ultimately, as you get the back savings,
**00:09:42 --> 00:09:45:** you know faster, cheaper in the field.
**00:09:45 --> 00:09:48:** But it takes a little more effort upfront and and
**00:09:48 --> 00:09:52:** I don't mean necessarily that it's a lot more effort,
**00:09:52 --> 00:09:55:** it's just you need to have your team together.
**00:09:55 --> 00:09:58:** At least in my opinion as early as possible so
**00:09:58 --> 00:10:00:** you're all working together.
**00:10:00 --> 00:10:02:** So to go back to the example of having two
**00:10:03 --> 00:10:04:** separate engineers,
**00:10:04 --> 00:10:07:** you're going to have an engineer that's putting some design
**00:10:07 --> 00:10:09:** together on those modular.
**00:10:09 --> 00:10:14:** Boxes because they are each manufacturer has their own approach.
**00:10:14 --> 00:10:17:** So you have to have that engineer that's designing the
**00:10:17 --> 00:10:20:** modular box at the same time that you're built.
**00:10:20 --> 00:10:24:** You have your engineer designing the structure because there's also
**00:10:24 --> 00:10:25:** two approval processes.
**00:10:25 --> 00:10:27:** You have a state approval,
**00:10:27 --> 00:10:30:** at least in California, you have a state approval for

**00:10:30 --> 00:10:31:** the modular,
**00:10:31 --> 00:10:33:** and you have a local authority.
**00:10:33 --> 00:10:35:** You know, in this case,
**00:10:35 --> 00:10:38:** Los Angeles Department of Building and safety that is approving
**00:10:38 --> 00:10:39:** the structure,
**00:10:39 --> 00:10:41:** meaning the foundations, the the podium,
**00:10:41 --> 00:10:43:** the if there's a concrete core,
**00:10:43 --> 00:10:45:** and some. And with here,
**00:10:45 --> 00:10:47:** in a seismic zone, you've gotta transfer.
**00:10:47 --> 00:10:50:** And I'm maybe speaking outside my expertise,
**00:10:50 --> 00:10:53:** Matt. But you gotta transfer those loads from that concrete
**00:10:54 --> 00:10:57:** core for those seismic loads from the concrete core to
**00:10:57 --> 00:10:58:** the outside of those,
**00:10:58 --> 00:11:02:** those modular buildings and and get that that shear transfer
**00:11:02 --> 00:11:02:** correct?
**00:11:03 --> 00:11:07:** Yeah, it's certainly an understanding of coordination and really working
**00:11:07 --> 00:11:11:** together knowing what loads you're expecting and drawing lines on
**00:11:11 --> 00:11:14:** who's doing what and who's responsible for making that connection
**00:11:14 --> 00:11:18:** or making the dragline to the wall and who's ultimately
**00:11:18 --> 00:11:20:** responsible for the concrete core.
**00:11:20 --> 00:11:24:** The engineer of record. Just putting putting scope in the
**00:11:24 --> 00:11:26:** right camps at the right
**00:11:26 --> 00:11:26:** time,
**00:11:26 --> 00:11:27:** yes, ultimately it solves you.
**00:11:27 --> 00:11:31:** If it resolves the having to redesign or I thought
**00:11:31 --> 00:11:34:** we were doing this and and do it all at
**00:11:34 --> 00:11:36:** the same time.
**00:11:36 --> 00:11:37:** Design it once you know
**00:11:37 --> 00:11:39:** one of these conversations you know,
**00:11:39 --> 00:11:42:** I would say two or three years ago.
**00:11:42 --> 00:11:45:** A lot of the conversation with with modular or any
**00:11:45 --> 00:11:49:** off-site construction was how old does the local jurisdiction look
**00:11:50 --> 00:11:50:** at this?
**00:11:50 --> 00:11:52:** How do they plan check it?
**00:11:52 --> 00:11:56:** And that conversation really has pretty much gone away because
**00:11:56 --> 00:12:00:** most most major cities or municipalities kind of know how
**00:12:00 --> 00:12:00:** to do it.

**00:12:00 --> 00:12:03:** You know, if they haven't done it a lot,
**00:12:03 --> 00:12:06:** they've seen others that have done it.
**00:12:06 --> 00:12:09:** So I hear much less about how we do.
**00:12:09 --> 00:12:12:** We plan check this and that's kind of going away
**00:12:12 --> 00:12:13:** as an issue,
**00:12:13 --> 00:12:15:** at least from what I'm
**00:12:15 --> 00:12:17:** seeing. I think they do that Mark is what is
**00:12:17 --> 00:12:21:** from your side as the design side is something that
**00:12:21 --> 00:12:24:** makes that very clear is what you what KTGY does
**00:12:24 --> 00:12:27:** on their documents. It makes it very clear there's a
**00:12:27 --> 00:12:30:** color document that says this color is on site work.
**00:12:30 --> 00:12:32:** This color is is is factory work,
**00:12:32 --> 00:12:35:** so it's very clear not only to the bidders,
**00:12:35 --> 00:12:37:** but it's also very clear.
**00:12:37 --> 00:12:40:** Two to the authorities having jurisdiction and what they're reviewing,
**00:12:40 --> 00:12:42:** what they're not, that's true.
**00:12:42 --> 00:12:46:** We really have changed the way for modular and off-site
**00:12:46 --> 00:12:49:** projects where that it has changed the way we document,
**00:12:49 --> 00:12:53:** and we also realize 'cause our clients realize that unless
**00:12:53 --> 00:12:57:** the scope is clear to the people who are building
**00:12:57 --> 00:12:58:** it orbiting it,
**00:12:58 --> 00:13:01:** it's hard to get to realize actual cost savings.
**00:13:01 --> 00:13:04:** 'cause where did where does my work start as a
**00:13:04 --> 00:13:07:** subcontractor and and stop and so?
**00:13:07 --> 00:13:09:** You want to make sure you're not paying twice.
**00:13:09 --> 00:13:10:** Obviously thinking
**00:13:10 --> 00:13:12:** one of your slides you have.
**00:13:12 --> 00:13:14:** That colored document I think,
**00:13:14 --> 00:13:15:** or something similar. You're
**00:13:15 --> 00:13:21:** right, I do, yeah. I think,
**00:13:21 --> 00:13:22:** well, this is. This is a.
**00:13:22 --> 00:13:26:** It's a presentation version, but really you know the the
**00:13:26 --> 00:13:27:** the the site work,
**00:13:27 --> 00:13:29:** what's built on site is documented,
**00:13:29 --> 00:13:31:** it's just a parameter in Revit.
**00:13:31 --> 00:13:34:** It's not very complicated. What's what the modular piece?
**00:13:34 --> 00:13:36:** And then the the third phase.
**00:13:36 --> 00:13:39:** Really we're calling the zip up or the cladding,
**00:13:39 --> 00:13:42:** or however you want to think about it,
**00:13:42 --> 00:13:44:** 'cause there really aren't two phases.
**00:13:44 --> 00:13:46:** There's not on site off-site.

**00:13:46 --> 00:13:49:** There's on site off site and then completion or zip
**00:13:49 --> 00:13:49:** up,
**00:13:49 --> 00:13:51:** so there's really. That third phase,
**00:13:51 --> 00:13:54:** and so we. That's a lot of where this this
**00:13:54 --> 00:13:57:** third phase is where the scope gets confusing,
**00:13:57 --> 00:14:00:** potentially to subcontractors bidding. But Speaking of costs,
**00:14:00 --> 00:14:02:** you know we've we have,
**00:14:02 --> 00:14:03:** you know, all of us,
**00:14:03 --> 00:14:07:** and probably many of you have listened to a lot
**00:14:07 --> 00:14:08:** of conversations,
**00:14:08 --> 00:14:11:** and I'm like really happy to have a kind of
**00:14:11 --> 00:14:15:** in process cost estimate that day's been putting together on
**00:14:15 --> 00:14:16:** a modular building.
**00:14:16 --> 00:14:19:** Dave, you wanna talk a little bit about this?
**00:14:19 --> 00:14:20:** So I'll first
**00:14:20 --> 00:14:22:** caveat this with you know,
**00:14:22 --> 00:14:25:** it's like when, how much does a car cost,
**00:14:25 --> 00:14:28:** right? So every building's got its own unique,
**00:14:28 --> 00:14:32:** unique. Features that affect the price and So what this
**00:14:32 --> 00:14:36:** is showing that Mark and I are working on along
**00:14:36 --> 00:14:39:** with others is kind of trying to create this.
**00:14:39 --> 00:14:43:** Kind of presentation like this is what it could be.
**00:14:43 --> 00:14:45:** So what you're seeing here is,
**00:14:45 --> 00:14:48:** I think you get from a cost perspective between a
**00:14:48 --> 00:14:52:** Type 3 conventional build wood frame project versus volumetric modular
**00:14:52 --> 00:14:52:** year,
**00:14:52 --> 00:14:55:** probably zero. I'll go zero to 15%
**00:14:55 --> 00:14:58:** difference and in cost, meaning modular being cheaper.
**00:14:58 --> 00:15:01:** It's to it, we don't see it being more.
**00:15:01 --> 00:15:03:** We see it being less,
**00:15:03 --> 00:15:06:** but there's a lot of parameters on why it would
**00:15:06 --> 00:15:09:** be somewhere between 0 and 15 so.
**00:15:09 --> 00:15:12:** This one in particular is on the higher end.
**00:15:12 --> 00:15:15:** One of the main reasons is because it's a prevailing
**00:15:15 --> 00:15:16:** wage project,
**00:15:16 --> 00:15:18:** and So what you're seeing is,
**00:15:18 --> 00:15:21:** you know you're shifting a lot of that labor that
**00:15:21 --> 00:15:24:** would be in the field paying prevailing wage rates,
**00:15:24 --> 00:15:28:** and you know California prevailing wage rates are pretty high,
**00:15:28 --> 00:15:31:** and shifting it to a a factory wage rate that

**00:15:31 --> 00:15:33:** is not subject to prevailing wage.
**00:15:33 --> 00:15:35:** So you're, you're. You're just that alone.
**00:15:35 --> 00:15:39:** You're there's a quite a bit of savings between prevailing
**00:15:39 --> 00:15:40:** wage and open shop.
**00:15:40 --> 00:15:44:** So then you take the fact that you're you're shifting
**00:15:44 --> 00:15:46:** all that that to shop labor.
**00:15:46 --> 00:15:49:** That's where you're getting your your your biggest savings here
**00:15:49 --> 00:15:49:** so,
**00:15:49 --> 00:15:53:** but you, you're typically going to see regardless of project,
**00:15:53 --> 00:15:55:** somewhere in the zero to 15%
**00:15:55 --> 00:15:57:** range, and I say zero to 15%
**00:15:57 --> 00:15:59:** because that's that's hard cost you're.
**00:15:59 --> 00:16:03:** You're clearly going to save on soft costs as well,
**00:16:03 --> 00:16:07:** because I don't know if you got the next slide
**00:16:07 --> 00:16:08:** schedule.
**00:16:08 --> 00:16:11:** Is kind of a very.
**00:16:11 --> 00:16:14:** Broad look at schedule is if we're looking at a
**00:16:14 --> 00:16:18:** similar sized project that would take you know 16 to
**00:16:18 --> 00:16:22:** 18 months to build conventionally in the field is taking
**00:16:22 --> 00:16:25:** between 12 to 14 months to build it and modular
**00:16:25 --> 00:16:29:** and so you're not only saving on the general conditions
**00:16:29 --> 00:16:33:** cost of of four months of having a contractor out
**00:16:33 --> 00:16:36:** for for additional four months on a job,
**00:16:36 --> 00:16:40:** but you're also got the soft cost savings your carry
**00:16:40 --> 00:16:42:** costs for for a loan or the.
**00:16:42 --> 00:16:45:** Quicker to bring it to market and start generating revenue
**00:16:45 --> 00:16:47:** or even even for me.
**00:16:47 --> 00:16:50:** It's cheaper because I you know on a conventional build
**00:16:50 --> 00:16:53:** I would probably have three to four superintendents on a
**00:16:53 --> 00:16:54:** project where a modular.
**00:16:54 --> 00:16:57:** I could probably get away with two.
**00:16:57 --> 00:17:01:** So even then, even even the overall general conditions are
**00:17:01 --> 00:17:02:** reduced because I need less money,
**00:17:02 --> 00:17:04:** less manpower to manage the project.
**00:17:06 --> 00:17:09:** And I think from from a from a cost perspective,
**00:17:09 --> 00:17:13:** there's also that kind of leads us.
**00:17:13 --> 00:17:17:** Leads us into the next type panelization because there there's
**00:17:17 --> 00:17:19:** a couple ways to realize value.
**00:17:19 --> 00:17:22:** One is obviously the actual cost of parity,
**00:17:22 --> 00:17:26:** right type 3 to a modular or some other version
**00:17:26 --> 00:17:29:** right that compares or competes with Type 3,

**00:17:29 --> 00:17:33:** but again, the other thing is to create a little
**00:17:33 --> 00:17:34:** bit more value,
**00:17:34 --> 00:17:37:** and that's something that panelization can do.
**00:17:37 --> 00:17:40:** Again, as I kind of alluded to that mid rise
**00:17:41 --> 00:17:41:** space,
**00:17:41 --> 00:17:45:** this is a project. In Salt Lake City that we
**00:17:45 --> 00:17:48:** have under construction right now,
**00:17:48 --> 00:17:50:** and it's it's two buildings.
**00:17:50 --> 00:17:54:** A 12 story and an 8 story building,
**00:17:54 --> 00:18:00:** all with steel stud prefabricated load bearing steel stud prefabricated
**00:18:00 --> 00:18:04:** so it's a way to get above that 85 foot
**00:18:04 --> 00:18:08:** building code height limit on Type 3 podium without.
**00:18:08 --> 00:18:10:** Entering the world of you know,
**00:18:10 --> 00:18:14:** a high rise structure that is really meant and efficient
**00:18:14 --> 00:18:14:** to go.
**00:18:14 --> 00:18:18:** 20 or 30 storeys. That's when you realize value from
**00:18:18 --> 00:18:18:** that system.
**00:18:18 --> 00:18:21:** So where does the mid rise fit in?
**00:18:21 --> 00:18:26:** Could be modular, like the hotel we just looked at
**00:18:26 --> 00:18:27:** earlier or could be.
**00:18:27 --> 00:18:32:** Could be the panelization in a steel stud scenario for
**00:18:32 --> 00:18:33:** these two buildings,
**00:18:33 --> 00:18:38:** so this we're seeing more and more of and there
**00:18:38 --> 00:18:40:** are different versions of this.
**00:18:40 --> 00:18:45:** There's this is another project in Salt Lake City that's
**00:18:45 --> 00:18:46:** nearly complete now.
**00:18:46 --> 00:18:51:** The exchange nine stories penalized and this one was proprietary.
**00:18:51 --> 00:18:56:** There's there's a number of proprietary steel bearing steel systems
**00:18:56 --> 00:18:57:** we have worked with,
**00:18:57 --> 00:19:01:** President. This one happens to be Infinity and you know.
**00:19:01 --> 00:19:04:** And there's also buildings that don't use a proprietary system
**00:19:04 --> 00:19:05:** but are just,
**00:19:05 --> 00:19:07:** you know, engineered, straight up and and Matt.
**00:19:07 --> 00:19:10:** I don't know, maybe you could speak to that a
**00:19:10 --> 00:19:11:** little bit.
**00:19:12 --> 00:19:15:** Yeah, I think it's important vacation time and there's a
**00:19:15 --> 00:19:19:** couple of different securities times of projects to being the
**00:19:19 --> 00:19:22:** private area or two proprietary options you just mentioned,
**00:19:22 --> 00:19:25:** but then you know these can be formed.
**00:19:25 --> 00:19:27:** Specified load bearing studs as well.

**00:19:27 --> 00:19:30:** You know there's a number of manufacturers even into Southern

**00:19:30 --> 00:19:31:** California alone,

**00:19:31 --> 00:19:33:** but throughout the US that is able to take performance

**00:19:33 --> 00:19:37:** specifications and drawing structural drawings and then built panelized versions

**00:19:38 --> 00:19:39:** of all those elements.

**00:19:39 --> 00:19:42:** You know, walls where they belong and it's it's the

**00:19:42 --> 00:19:43:** same precision.

**00:19:43 --> 00:19:46:** Manufacturing, you know, early loaded shop drawings you know measure

**00:19:46 --> 00:19:46:** twice,

**00:19:46 --> 00:19:48:** cut once, but it's done built.

**00:19:48 --> 00:19:50:** It doesn't need to be,

**00:19:50 --> 00:19:52:** you know, framed into these.

**00:19:52 --> 00:19:55:** Sometimes those proprietary systems have constraints you need to work

**00:19:55 --> 00:19:56:** within those,

**00:19:56 --> 00:19:58:** but if you want the flexibility or you want the

**00:19:58 --> 00:20:02:** ability to sort Slater and not get married right away

**00:20:02 --> 00:20:04:** to a particular system of manufacturer,

**00:20:04 --> 00:20:06:** then this is the other route.

**00:20:06 --> 00:20:09:** Is that you have it non proprietary open source and

**00:20:09 --> 00:20:10:** performance specification.

**00:20:11 --> 00:20:13:** And in this I'm also.

**00:20:13 --> 00:20:17:** I also think there's a big difference if you're in

**00:20:17 --> 00:20:18:** a seismic zone too,

**00:20:18 --> 00:20:21:** right? Because these projects are in Utah,

**00:20:21 --> 00:20:23:** there's, you know, California is pretty different,

**00:20:23 --> 00:20:26:** and so and I, I think all of these column

**00:20:26 --> 00:20:27:** construction,

**00:20:27 --> 00:20:29:** innovative or alternate technologies. They obviously,

**00:20:29 --> 00:20:31:** especially in a seismic zone,

**00:20:31 --> 00:20:35:** really have have to prove themselves and have specific approaches.

**00:20:35 --> 00:20:37:** So there's, I guess shades and variations.

**00:20:37 --> 00:20:40:** Is that a good way to put it,

**00:20:40 --> 00:20:41:** Matt?

**00:20:42 --> 00:20:45:** Correct, yeah, the same manufacturer that can produce very structure

**00:20:45 --> 00:20:48:** east of the Rockies will have trouble getting higher than

**00:20:48 --> 00:20:50:** six or five stories West of the Rockies,

**00:20:50 --> 00:20:53:** though you gotta get to know where your jurisdiction is

**00:20:53 --> 00:20:56:** as well and and play to the strengths of the
**00:20:56 --> 00:20:59:** manufacturer and that also ways into the decision on whether
**00:20:59 --> 00:21:01:** you go open source number,
**00:21:01 --> 00:21:04:** price or if you if you do get married.
**00:21:04 --> 00:21:07:** Depending on what kind of building you're trying to build
**00:21:07 --> 00:21:09:** and what you can build where you are,
**00:21:09 --> 00:21:09:** and
**00:21:09 --> 00:21:12:** from a builder's perspective, I like the idea.
**00:21:12 --> 00:21:15:** Of design Bill put it all in,
**00:21:15 --> 00:21:19:** put it all in the one manufacturer and installers hands
**00:21:19 --> 00:21:23:** so there's not a a difference of opinion from engineer
**00:21:24 --> 00:21:27:** to engineer of how to how to put it together.
**00:21:27 --> 00:21:30:** You know, that's that's my perspective.
**00:21:30 --> 00:21:34:** But also, you know, I also say that the value
**00:21:34 --> 00:21:37:** of this is it's being fabricated.
**00:21:37 --> 00:21:40:** While you were doing some of the on site work
**00:21:40 --> 00:21:41:** similar to like modular,
**00:21:41 --> 00:21:43:** if you're building. If you got to go in your
**00:21:43 --> 00:21:44:** basement,
**00:21:44 --> 00:21:47:** if you got a basement or you're building a podium,
**00:21:47 --> 00:21:51:** you're fabricating the walls outside while you're doing the on
**00:21:51 --> 00:21:52:** site work so.
**00:21:52 --> 00:21:54:** You can't wait until you start doing the on site
**00:21:54 --> 00:21:57:** work to start to get your fabricator on though,
**00:21:57 --> 00:22:00:** so 'cause those things have to be done ahead of
**00:22:00 --> 00:22:00:** time,
**00:22:00 --> 00:22:03:** 'cause that's the value of this is you're you're saving
**00:22:03 --> 00:22:06:** a lot of from from a builder's perspective,
**00:22:06 --> 00:22:09:** you save a lot of time because you're you're building
**00:22:09 --> 00:22:09:** off
**00:22:09 --> 00:22:12:** site, which is kind of all of these scenarios from
**00:22:12 --> 00:22:12:** most part,
**00:22:12 --> 00:22:15:** and you know, from a design perspective what I what
**00:22:15 --> 00:22:18:** I notice is the critical path shifts around in in
**00:22:18 --> 00:22:21:** offsite where there's an offsite technology where really the you
**00:22:21 --> 00:22:23:** know getting the transformer set.
**00:22:23 --> 00:22:24:** Might become the critical path,
**00:22:24 --> 00:22:27:** whereas in a conventional built it isn't.
**00:22:27 --> 00:22:29:** So the in order to in order to reap the
**00:22:29 --> 00:22:30:** benefits,
**00:22:30 --> 00:22:33:** you kind of have to pivot your thinking a little

**00:22:33 --> 00:22:34:** bit.
**00:22:34 --> 00:22:37:** So OK, Now what controls the schedule 'cause it might
**00:22:37 --> 00:22:39:** be something different than it used to?
**00:22:39 --> 00:22:39:** Yeah,
**00:22:39 --> 00:22:42:** it's an interesting point, so we're looking at things like
**00:22:42 --> 00:22:44:** modular elevators where they're pre fabbed.
**00:22:44 --> 00:22:46:** Elevators were looking at precast stairs,
**00:22:46 --> 00:22:49:** things like that where we don't want to be waiting
**00:22:50 --> 00:22:53:** for the elevator to get installed won't be waiting for
**00:22:53 --> 00:22:54:** steel stairs.
**00:22:54 --> 00:22:57:** The other, the other components happened so fast in the
**00:22:57 --> 00:22:57:** field.
**00:22:57 --> 00:23:01:** We want those. We want the elevator and the stairs
**00:23:01 --> 00:23:01:** to not become
**00:23:01 --> 00:23:05:** the critical path right? Deferred submittals seem like a good
**00:23:05 --> 00:23:06:** idea until you realize their time,
**00:23:06 --> 00:23:11:** right? OK, so let's move on to mass timber,
**00:23:11 --> 00:23:14:** which I I feel like it's kind of the the
**00:23:14 --> 00:23:18:** the newest one of these and and and it really
**00:23:18 --> 00:23:22:** is new because it's suddenly useful now right?
**00:23:22 --> 00:23:26:** With with really respect to the changes in the building
**00:23:26 --> 00:23:28:** code and you know kind of.
**00:23:28 --> 00:23:32:** Excitingly Matt has been involved literally in in the code
**00:23:32 --> 00:23:35:** changes at the forefront of writing some of this.
**00:23:35 --> 00:23:39:** So you want to kind of give us a little?
**00:23:39 --> 00:23:40:** Overview Map yeah
**00:23:40 --> 00:23:45:** those not familiar 10 second review mass timber is component
**00:23:45 --> 00:23:50:** prefabricated wood elements that are massive and by being math
**00:23:51 --> 00:23:55:** here or is this some calculatable fire and that fire
**00:23:55 --> 00:24:01:** resistance has allowed master into a larger scale of destruction
**00:24:01 --> 00:24:02:** type then?
**00:24:02 --> 00:24:06:** Wood construction adopted by the IBC 2021 and early adopted
**00:24:06 --> 00:24:10:** by an updates on the West Coast already come in
**00:24:10 --> 00:24:13:** from Utah all the way to California.
**00:24:13 --> 00:24:16:** Are construction types for C will be in four A
**00:24:17 --> 00:24:21:** that permit timber buildings to be built at 9 stories,
**00:24:21 --> 00:24:24:** 12 stories or up to 18 stories maximum with different
**00:24:25 --> 00:24:26:** variations of absolution,
**00:24:26 --> 00:24:29:** non combustive protection. So like Mark said,

**00:24:29 --> 00:24:31:** this is a recurring theme,
**00:24:31 --> 00:24:35:** it's really. Opened up the the range of building heights
**00:24:35 --> 00:24:38:** between 85 feet and 100 and 12180 feet now to
**00:24:39 --> 00:24:42:** something other than than steel and concrete and wood.
**00:24:42 --> 00:24:46:** Is there plays a role obviously in the sustainable city,
**00:24:46 --> 00:24:49:** depending on whether it's for C or 4B,
**00:24:49 --> 00:24:52:** you get to see some of that wood,
**00:24:52 --> 00:24:56:** and there's a real sales pitch and steady component that
**00:24:56 --> 00:25:00:** goes with this and then type 4A is completely encapsulated
**00:25:00 --> 00:25:02:** but still speeding up construction.
**00:25:02 --> 00:25:07:** Provided the right pre fabrication and pre planning processes are
**00:25:08 --> 00:25:09:** ahead of construction.
**00:25:09 --> 00:25:13:** So there's also that benefit for type 4A.
**00:25:13 --> 00:25:14:** At the next slide just,
**00:25:14 --> 00:25:16:** I think if you want to,
**00:25:16 --> 00:25:19:** yeah. Take one look the way I like to think
**00:25:19 --> 00:25:21:** about mass timber is.
**00:25:21 --> 00:25:22:** It's really wouldn't freak out.
**00:25:22 --> 00:25:24:** You can treat it the same way.
**00:25:24 --> 00:25:27:** The requirements for pre coordination and pre design are the
**00:25:27 --> 00:25:28:** same As for precast.
**00:25:28 --> 00:25:31:** It needs to be thought of before you hit the
**00:25:31 --> 00:25:31:** ground.
**00:25:31 --> 00:25:34:** You can't wait until things were happening on site during
**00:25:34 --> 00:25:35:** construction.
**00:25:35 --> 00:25:37:** But because it is larger members,
**00:25:37 --> 00:25:40:** it's it's faster and you're doing 2 days at once.
**00:25:40 --> 00:25:41:** You know be columns, go up,
**00:25:41 --> 00:25:45:** beams span between them and then these planks come out
**00:25:45 --> 00:25:47:** and you're laying out a lot of floor at one
**00:25:47 --> 00:25:47:** time,
**00:25:47 --> 00:25:50:** potentially twice as fast as cast in place construction.
**00:25:54 --> 00:25:57:** So we met and I had been collaborating on a
**00:25:57 --> 00:25:58:** project.
**00:25:58 --> 00:26:03:** You know, basically a 12 Storey timber tower and this
**00:26:03 --> 00:26:07:** really came out of our working with a client in
**00:26:07 --> 00:26:11:** a site in Korea Town in LA which had unlimited
**00:26:11 --> 00:26:13:** height but a limited budget.
**00:26:13 --> 00:26:17:** And really the yield that we could get were,
**00:26:17 --> 00:26:19:** you know it's housing was,
**00:26:19 --> 00:26:23:** you know we couldn't get more than 120 units in

**00:26:23 --> 00:26:24:** a podium.
**00:26:24 --> 00:26:27:** Type 3 podium, very dense is the best we could
**00:26:27 --> 00:26:27:** do.
**00:26:27 --> 00:26:29:** Unlimited height, plenty of FAR.
**00:26:29 --> 00:26:32:** It was crazy to leave that on the table.
**00:26:32 --> 00:26:34:** We said, hey, look at modular no.
**00:26:34 --> 00:26:36:** No, we don't wanna look at modular.
**00:26:36 --> 00:26:39:** Look at mass timber. We have been burnt by innovative.
**00:26:39 --> 00:26:42:** We don't want to do it and we said we
**00:26:42 --> 00:26:44:** kind of looked at each other,
**00:26:44 --> 00:26:46:** said, well, we'll do it,
**00:26:46 --> 00:26:49:** you know, so we're right in the process of designing
**00:26:49 --> 00:26:53:** engineering and we're almost to the costing part of this
**00:26:53 --> 00:26:54:** to prove it out.
**00:26:54 --> 00:26:59:** Just like. Just like Dave was showing on the modular.
**00:26:59 --> 00:27:04:** So because we understand that taking that first step can
**00:27:04 --> 00:27:05:** be a little bit.
**00:27:05 --> 00:27:08:** You know, people can be hesitant,
**00:27:08 --> 00:27:10:** development teams can be hesitant.
**00:27:10 --> 00:27:14:** Timber has been used a lot on office building or
**00:27:14 --> 00:27:16:** I say a lot fairly.
**00:27:16 --> 00:27:19:** It's not unusual for office buildings because the spans are
**00:27:19 --> 00:27:20:** similar to steal,
**00:27:20 --> 00:27:23:** but we really dug into what would this mean for
**00:27:23 --> 00:27:24:** a housing project,
**00:27:24 --> 00:27:28:** and I think the conclusion that we collectively have come
**00:27:28 --> 00:27:31:** to is you actually end up using the most efficient
**00:27:31 --> 00:27:34:** system for housing where the spans really don't need to
**00:27:34 --> 00:27:38:** be. That great is actually a beamless system where you
**00:27:38 --> 00:27:40:** just have plank in a column.
**00:27:40 --> 00:27:43:** And and met you and I guess,
**00:27:43 --> 00:27:45:** explain that a little bit better
**00:27:45 --> 00:27:46:** than I did. Yeah, yeah,
**00:27:46 --> 00:27:50:** the reasons that mass timber has such momentum behind it
**00:27:50 --> 00:27:50:** is there.
**00:27:50 --> 00:27:52:** I wouldn't call them new,
**00:27:52 --> 00:27:55:** but within the last 30 years different products have been
**00:27:55 --> 00:27:57:** developed that have different properties.
**00:27:57 --> 00:28:00:** It's not the same as stick frame lumber.
**00:28:00 --> 00:28:02:** You know where everything is 1 directional.
**00:28:02 --> 00:28:04:** Now you have cross laminated timber panels,
**00:28:04 --> 00:28:08:** which is basically a weave of dimensional lumber adhered

together
**00:28:08 --> 00:28:11:** with with glue and these can act as diaphragms.
**00:28:11 --> 00:28:13:** They have in plane shear capabilities that takes off,
**00:28:13 --> 00:28:16:** you know plywood sheeting or concrete topping out of the
**00:28:16 --> 00:28:16:** mix.
**00:28:16 --> 00:28:18:** If you don't need it also allows the panels to
**00:28:19 --> 00:28:21:** span in two directions so you have the ability to
**00:28:21 --> 00:28:22:** have a longer span.
**00:28:22 --> 00:28:25:** In this case we've got a 10 by 15 grid
**00:28:25 --> 00:28:27:** or 10 by 13 grid.
**00:28:27 --> 00:28:30:** Where the panels are spinning in the long direction to
**00:28:30 --> 00:28:33:** the to what I would call it a column strip.
**00:28:33 --> 00:28:36:** A shorter direction column strip and in that way there
**00:28:36 --> 00:28:39:** are no beams and you start to really be able
**00:28:39 --> 00:28:41:** to compress your floor to floor heights,
**00:28:41 --> 00:28:44:** which is obviously a material saving on exterior skin.
**00:28:44 --> 00:28:47:** But it also makes everything more akin to cast in
**00:28:47 --> 00:28:50:** place construction and other competitive Type 1.
**00:28:50 --> 00:28:53:** Charts, and we're typically seeing a high rise building.
**00:28:54 --> 00:28:57:** And that's we're also, you know,
**00:28:57 --> 00:29:01:** I, as Matt mentioned, there's a significant sustainability aspect.
**00:29:01 --> 00:29:06:** There's also, we are. We're looking at a for some
**00:29:06 --> 00:29:07:** coastal areas.
**00:29:07 --> 00:29:12:** Buildings that have typically have pretty deep pile foundations.
**00:29:12 --> 00:29:15:** The whole building is a lot lighter,
**00:29:15 --> 00:29:20:** so there's some inherent advantage from a foundation system in
**00:29:20 --> 00:29:23:** keeping the building lighter in,
**00:29:23 --> 00:29:27:** especially in in. Places with a really bad soil,
**00:29:27 --> 00:29:29:** so there's some. There's some pragmatic,
**00:29:29 --> 00:29:33:** there's some aspirational things depending on the the kind of
**00:29:33 --> 00:29:35:** where the developer is coming from,
**00:29:35 --> 00:29:39:** but lots of possibilities would feel like and I'll just
**00:29:39 --> 00:29:43:** add Mark to that. The lightness of the structure in
**00:29:43 --> 00:29:46:** our experience off the weight of a.
**00:29:46 --> 00:29:50:** Size concrete building it everywhere foundations to lateral system and
**00:29:50 --> 00:29:53:** just you know the savings do start to trickle out
**00:29:53 --> 00:29:56:** of the system savings even though the material itself might
**00:29:56 --> 00:29:59:** be at this point in time across premium,
**00:29:59 --> 00:30:02:** it does trickle down elsewhere to have structure you can

**00:30:02 --> 00:30:05:** pull out because of the the different building weight.
**00:30:08 --> 00:30:11:** And that the only the other thing that I'm kind
**00:30:11 --> 00:30:14:** of I I see developing is more suppliers and more
**00:30:14 --> 00:30:17:** suppliers expanding the way in which they they.
**00:30:17 --> 00:30:20:** They're able to manufacture, and I I feel like you
**00:30:20 --> 00:30:23:** have your finger on the pulse of that Matt.
**00:30:23 --> 00:30:26:** I mean, what are you seeing in this in North
**00:30:26 --> 00:30:26:** America?
**00:30:28 --> 00:30:31:** In North America, there's still a ton of capacity.
**00:30:31 --> 00:30:34:** Manufacturer come across Simon number panels,
**00:30:34 --> 00:30:38:** but then you know lumber in general.
**00:30:38 --> 00:30:40:** There is a question in the chat.
**00:30:40 --> 00:30:41:** Try and get you right.
**00:30:41 --> 00:30:45:** You know vulnerability and supply chains and material cost is
**00:30:45 --> 00:30:48:** which part of elements like more than half the cost
**00:30:48 --> 00:30:50:** of a about half the cost of a CLT panel
**00:30:50 --> 00:30:54:** is the material cost. So as it fluctuates you know
**00:30:54 --> 00:30:54:** to 400%
**00:30:54 --> 00:30:56:** like it has in the last six months.
**00:30:56 --> 00:30:59:** Yeah, that's something concerned with.
**00:30:59 --> 00:31:01:** And so then you start to see shifting to European
**00:31:01 --> 00:31:02:** suppliers that do.
**00:31:02 --> 00:31:05:** Have you know a little bit more dying and more
**00:31:05 --> 00:31:08:** repetitive process so it there is a little bit of
**00:31:08 --> 00:31:09:** up and down.
**00:31:09 --> 00:31:12:** I think the long term view is though I marked
**00:31:12 --> 00:31:15:** your question is that bought a supply available a lot
**00:31:15 --> 00:31:18:** of capacity to supply these projects in North America.
**00:31:18 --> 00:31:21:** And as these projects continue to be built a little
**00:31:21 --> 00:31:23:** bit smarter about wait to put them together.
**00:31:23 --> 00:31:26:** And the best way to specify projects so that they
**00:31:26 --> 00:31:29:** can be bid by all of those from furs and
**00:31:29 --> 00:31:29:** and.
**00:31:29 --> 00:31:32:** Two ultimately, the solution for your project,
**00:31:32 --> 00:31:35:** that project and I think to add to
**00:31:35 --> 00:31:39:** that on the question of the vulnerability is you're still
**00:31:39 --> 00:31:43:** putting like you take a modular or a metal stud
**00:31:43 --> 00:31:44:** framing project.
**00:31:44 --> 00:31:47:** I mean, they're still using the same components,
**00:31:47 --> 00:31:50:** so you're still vulnerable to some of that.
**00:31:50 --> 00:31:54:** I think what we're seeing in the market these days
**00:31:54 --> 00:31:58:** is a little bit of unpredictability of of supply chain,

**00:31:58 --> 00:32:00:** not necessarily consistency of missing or.
**00:32:00 --> 00:32:02:** Not available materials like you know.
**00:32:02 --> 00:32:06:** A few months ago is dealing with not being able
**00:32:06 --> 00:32:07:** to get metal deck.
**00:32:07 --> 00:32:10:** Now I'm dealing with they can't get polyiso insulation right?
**00:32:10 --> 00:32:13:** So it seems to be changing what's not available every
**00:32:14 --> 00:32:15:** month or something new,
**00:32:15 --> 00:32:17:** right? So in my mind.
**00:32:17 --> 00:32:21:** One of the things that all of these things addresses
**00:32:21 --> 00:32:22:** labor issues,
**00:32:22 --> 00:32:23:** and that's been an issue,
**00:32:23 --> 00:32:25:** and at least in Southern California,
**00:32:25 --> 00:32:28:** for for for years is even back to 2008 2009
**00:32:29 --> 00:32:30:** the market crashed.
**00:32:30 --> 00:32:32:** A lot of people left the industry,
**00:32:32 --> 00:32:36:** and even though we've been booming a lot of workers
**00:32:36 --> 00:32:39:** haven't come back to the industry,
**00:32:39 --> 00:32:40:** so there's been a shortage of Labor,
**00:32:40 --> 00:32:42:** so this is actually an plus.
**00:32:42 --> 00:32:46:** The rising cost of Labor so addresses that.
**00:32:46 --> 00:32:48:** To to address the material cost.
**00:32:48 --> 00:32:50:** I think there's an advantage to being an early,
**00:32:50 --> 00:32:53:** and because that's what we're trying to do on every
**00:32:53 --> 00:32:54:** construction project.
**00:32:54 --> 00:32:55:** Get materials quickly as possible,
**00:32:55 --> 00:32:57:** even if you've got a storm on site,
**00:32:57 --> 00:33:00:** which is, you know, not something you want to do
**00:33:00 --> 00:33:03:** 'cause you're double handling your your planning for storage space,
**00:33:03 --> 00:33:06:** etc. But you know we want just in time deliveries
**00:33:06 --> 00:33:09:** button now and given the market we're trying to get
**00:33:09 --> 00:33:11:** materials as early as possible.
**00:33:11 --> 00:33:12:** So when you're looking at,
**00:33:12 --> 00:33:15:** you know, like for a modular perspective where you're building
**00:33:15 --> 00:33:16:** all those units.
**00:33:16 --> 00:33:20:** Innofactor you're getting. All of your materials up front all
**00:33:20 --> 00:33:22:** at once early on the project,
**00:33:22 --> 00:33:24:** and so it's somewhat, you know,
**00:33:24 --> 00:33:26:** that strategy we're doing with in the field,
**00:33:26 --> 00:33:29:** where get all the materials on site as quickly as
**00:33:29 --> 00:33:30:** possible,
**00:33:30 --> 00:33:33:** so. I I guess I it's.

**00:33:33 --> 00:33:36:** It's hard to answer that question because there's some.
**00:33:36 --> 00:33:39:** There's some volatility in in the market right now,
**00:33:39 --> 00:33:43:** but I feel like that that is going to somewhat
**00:33:43 --> 00:33:44:** remedy that.
**00:33:44 --> 00:33:47:** I I don't think it's going to completely solve the
**00:33:47 --> 00:33:51:** problem because there's a little bit of too much uncertainty
**00:33:51 --> 00:33:51:** out there,
**00:33:51 --> 00:33:52:** but
**00:33:52 --> 00:33:54:** I think it'll it'll help,
**00:33:54 --> 00:33:56:** and I think at least from my perspective,
**00:33:56 --> 00:33:58:** you know it's the best.
**00:33:58 --> 00:34:02:** It's the best commercial for having legit pre construction services.
**00:34:02 --> 00:34:05:** Meaning the project I feel like for for anything,
**00:34:05 --> 00:34:07:** especially at one of these alternative methods,
**00:34:07 --> 00:34:09:** you really have to have those.
**00:34:09 --> 00:34:11:** I mean I try to get clients to get have
**00:34:11 --> 00:34:14:** pre construction as a matter of course 'cause I think
**00:34:14 --> 00:34:16:** it's good practice,
**00:34:16 --> 00:34:18:** but I I'd say it's maybe even more important in
**00:34:18 --> 00:34:22:** the when you're looking at a an alternative construction technology
**00:34:22 --> 00:34:25:** and then you know what I've got on the screen.
**00:34:25 --> 00:34:27:** Here is an interesting project that's a that's a going
**00:34:27 --> 00:34:28:** forward.
**00:34:28 --> 00:34:31:** I mean it's in design development right now in Northern
**00:34:31 --> 00:34:31:** California.
**00:34:31 --> 00:34:34:** It's a mass. Timber podium with and this talks to
**00:34:34 --> 00:34:36:** flexibility with either wood,
**00:34:36 --> 00:34:39:** modular or stick. Built wood on top,
**00:34:39 --> 00:34:41:** depending right depending on what.
**00:34:41 --> 00:34:45:** Depending on pricing we think that by mid DD will
**00:34:45 --> 00:34:49:** have to pull the trigger one way or the other.
**00:34:49 --> 00:34:52:** I'm not not we but the client,
**00:34:52 --> 00:34:55:** but as a way to this is a client that's
**00:34:55 --> 00:34:58:** very interested in mass timber,
**00:34:58 --> 00:35:01:** but. Didn't want to do a whole building so this
**00:35:01 --> 00:35:05:** is really just swapping out the concrete podium for mass
**00:35:05 --> 00:35:06:** timber podium.
**00:35:06 --> 00:35:10:** There's plenty of technical issues involved in that STC ratings.
**00:35:10 --> 00:35:12:** Things like that, then structural lateral,
**00:35:12 --> 00:35:15:** but it seems for the for the developer at least

**00:35:15 --> 00:35:18:** a very good way to get you know,
**00:35:18 --> 00:35:21:** to sort of dip their toe into into mass timber
**00:35:21 --> 00:35:23:** and preserves some flexibility.
**00:35:23 --> 00:35:25:** It's it's very similar to you know,
**00:35:25 --> 00:35:29:** a typical podium, just kind of swapping out pieces and
**00:35:29 --> 00:35:29:** parts.
**00:35:29 --> 00:35:32:** Except for this, you know automated parking tower,
**00:35:32 --> 00:35:35:** but that's a different web and R that's rosy.
**00:35:35 --> 00:35:38:** That's next month I think I'm just kidding,
**00:35:38 --> 00:35:40:** but basically that is in this.
**00:35:40 --> 00:35:43:** I kind of put in there as a sort of
**00:35:43 --> 00:35:47:** hybrid project where you know it is speaks to the
**00:35:47 --> 00:35:51:** nimbleness of trying to take advantage of aspects of some
**00:35:51 --> 00:35:55:** of these technologies may be in in a very expedient
**00:35:55 --> 00:35:55:** way,
**00:35:55 --> 00:35:58:** not in all in way which I think has some
**00:35:58 --> 00:35:59:** application.
**00:35:59 --> 00:36:03:** Marketplace and then kind of coming on to #4 in
**00:36:04 --> 00:36:09:** our innovative or alt construction types is really structural,
**00:36:09 --> 00:36:13:** precast and really that this is a project on the
**00:36:13 --> 00:36:17:** campus of Stanford and and this is really Matt.
**00:36:17 --> 00:36:19:** It's sort of all you.
**00:36:19 --> 00:36:23:** But why don't you give us a little oversight here
**00:36:23 --> 00:36:24:** in introduction?
**00:36:24 --> 00:36:25:** Yeah,
**00:36:25 --> 00:36:28:** one one point to make before we even ventured the
**00:36:28 --> 00:36:31:** project is just what we're talking about now is structural
**00:36:31 --> 00:36:33:** precast combined architectural,
**00:36:33 --> 00:36:37:** skin and structure combined. So there's all of course familiarity.
**00:36:37 --> 00:36:40:** I hope with frickin that is adhered to a building
**00:36:40 --> 00:36:41:** skeleton.
**00:36:41 --> 00:36:45:** In this case, we're talking about building where the entire
**00:36:45 --> 00:36:46:** thing is precast.
**00:36:46 --> 00:36:48:** So floors attached to walls,
**00:36:48 --> 00:36:52:** which is simultaneously the architectural exterior.
**00:36:52 --> 00:36:55:** Using what have you and this truck?
**00:36:55 --> 00:36:59:** This computer village graduate residences at Stanford is a group
**00:36:59 --> 00:37:00:** of buildings.
**00:37:00 --> 00:37:05:** 11:50 storeys high, all made out of precast concrete and
**00:37:05 --> 00:37:10:** it's a moment frame system with 60 foot spanning TT's

**00:37:10 --> 00:37:12:** on the interior that.
**00:37:12 --> 00:37:14:** That the residences are built on.
**00:37:17 --> 00:37:21:** The next goes. These panels fire suddenly all at once,
**00:37:21 --> 00:37:25:** but if you've done it on it's it's one bayonets,
**00:37:25 --> 00:37:29:** one story high. And it's the unit itself.
**00:37:29 --> 00:37:33:** How do you see the glazing pre-installed lifted into place,
**00:37:33 --> 00:37:37:** as is? The exterior is made for mark fitted for
**00:37:37 --> 00:37:42:** mark special forms and and that's that's really what goes
**00:37:42 --> 00:37:43:** into these.
**00:37:43 --> 00:37:45:** This is our concrete moment frame,
**00:37:45 --> 00:37:51:** reinforced saying there's. And couplers grab all these units,
**00:37:51 --> 00:37:57:** ticket each other, and really all these systems as one.
**00:37:57 --> 00:38:00:** Cohesive or entity. Insert all.
**00:38:04 --> 00:38:05:** And then the next show,
**00:38:05 --> 00:38:07:** I think the construction site,
**00:38:07 --> 00:38:10:** and I think maybe one of the bests here is
**00:38:10 --> 00:38:13:** really a benefit you see with a lot of prefabrication
**00:38:13 --> 00:38:18:** and Dave are mentioned this about reductive onset and supervision
**00:38:18 --> 00:38:21:** quiet. This site is it's it's basically cranes and and
**00:38:21 --> 00:38:23:** as these panels go up,
**00:38:23 --> 00:38:26:** not only do they replace standard safety barrier,
**00:38:26 --> 00:38:29:** you see right now there's temporary for for tie off,
**00:38:29 --> 00:38:32:** but once all these in the exterior.
**00:38:32 --> 00:38:35:** Is up then business as usual can find,
**00:38:35 --> 00:38:38:** so there's a component of safety involved with the past.
**00:38:38 --> 00:38:41:** There's a reduction in site presence on traffic that affects
**00:38:42 --> 00:38:44:** the surrounding neighborhood and the surrounding cities,
**00:38:44 --> 00:38:48:** and the workers themselves, when everything.
**00:38:48 --> 00:38:52:** At last, noise. This is an active campus and you're
**00:38:52 --> 00:38:56:** really this very benefits of reduction of disruption and trucks
**00:38:56 --> 00:39:00:** coming in is really something that is a priority or
**00:39:00 --> 00:39:03:** university like Stanford. Uhm, there's not.
**00:39:03 --> 00:39:06:** I'll mention you got a lot of pros going out
**00:39:06 --> 00:39:09:** and maybe the next slide Mark and the pros are
**00:39:09 --> 00:39:13:** that this is a great project and reprocess,
**00:39:13 --> 00:39:16:** and this is not the only location this is being
**00:39:16 --> 00:39:17:** used.
**00:39:17 --> 00:39:18:** There's other universities employing this,
**00:39:18 --> 00:39:21:** for example that were involved in.
**00:39:21 --> 00:39:25:** However, there's not a lot of precast outfits that perform
**00:39:25 --> 00:39:29:** level that knows them that can make you produce this

**00:39:29 --> 00:39:30:** entire on it.
**00:39:30 --> 00:39:33:** And becomes the Archi structure at one time.
**00:39:33 --> 00:39:36:** So just maybe point out that there's a little bit
**00:39:36 --> 00:39:38:** of limited when it comes to precast
**00:39:38 --> 00:39:41:** concrete for full buildings dead that we talked to,
**00:39:41 --> 00:39:43:** you know, we talked about pros,
**00:39:43 --> 00:39:46:** but there are a few cons too,
**00:39:46 --> 00:39:49:** right? I mean, one of the things on this is
**00:39:49 --> 00:39:50:** your it's in concrete,
**00:39:50 --> 00:39:53:** right? Your your interior walls are casting concrete,
**00:39:53 --> 00:39:56:** literally your your ability to to move later is limited.
**00:39:56 --> 00:39:59:** I think you're similar with a modular perspective.
**00:39:59 --> 00:40:02:** You know you're. You're you're somewhat set in your modular
**00:40:02 --> 00:40:03:** build for future,
**00:40:03 --> 00:40:07:** so you know, I think that's some of the decision
**00:40:07 --> 00:40:10:** making that has to go in up front is which
**00:40:10 --> 00:40:11:** system do you use?
**00:40:11 --> 00:40:13:** What's your long term vision of your property?
**00:40:13 --> 00:40:15:** Do you want flexibility for future?
**00:40:15 --> 00:40:18:** You know, if you want flexibility for future,
**00:40:18 --> 00:40:20:** maybe you don't go to a precast building.
**00:40:20 --> 00:40:23:** Or if you do precast building you do.
**00:40:23 --> 00:40:26:** Maybe the floors and exterior but leave the interior walls
**00:40:26 --> 00:40:28:** to be to be filled built.
**00:40:28 --> 00:40:31:** You know there there's some different things that you you
**00:40:31 --> 00:40:31:** know.
**00:40:31 --> 00:40:33:** Decisions to be made so there it's not.
**00:40:33 --> 00:40:36:** All. It's not all perfect rosy for every one of
**00:40:36 --> 00:40:39:** these situations everyone every job has its own unique criteria
**00:40:39 --> 00:40:42:** and an outcome and and future use for the building.
**00:40:42 --> 00:40:45:** And so I think you gotta take all that into
**00:40:45 --> 00:40:48:** account when you're making the decision on which one of
**00:40:48 --> 00:40:49:** these to go to.
**00:40:50 --> 00:40:52:** That's very true I, I think about the steel stud
**00:40:52 --> 00:40:53:** panels,
**00:40:53 --> 00:40:56:** penalized projects. I mean everyone is used to seeing steel
**00:40:56 --> 00:40:59:** studs in mid and high rises that are not structural.
**00:40:59 --> 00:41:02:** But it's like no, you can't cut a hole in
**00:41:02 --> 00:41:04:** that wall if it's load bearing.
**00:41:04 --> 00:41:05:** I mean it, that's the system.
**00:41:05 --> 00:41:08:** That's the structural system. So it it is.

**00:41:08 --> 00:41:11:** Yeah, there may be some future flexibility you're trading for
**00:41:11 --> 00:41:12:** sheriff sheer panels
**00:41:12 --> 00:41:13:** and those metal studs to write.
**00:41:13 --> 00:41:15:** You can't cut into this year.
**00:41:19 --> 00:41:20:** Not just one
**00:41:20 --> 00:41:24:** last slide is your from ways to do this arrangement.
**00:41:24 --> 00:41:28:** This idea of building prefabricated housing on those double Tees.
**00:41:28 --> 00:41:30:** Those 60 foot double correcting everything at once.
**00:41:30 --> 00:41:33:** It was not used for Stanford,
**00:41:33 --> 00:41:37:** however it is being used for other projects where.
**00:41:37 --> 00:41:39:** You've combined in in some ways my land and pre
**00:41:39 --> 00:41:42:** precast component precasting or component fabrication.
**00:41:42 --> 00:41:45:** Where you know this comes out on a truck and
**00:41:45 --> 00:41:48:** it's the rigging is already installed,
**00:41:48 --> 00:41:52:** it's incorporated into the precast double tee that will part
**00:41:52 --> 00:41:52:** of a final.
**00:41:52 --> 00:41:56:** You've already got the plow chassis to support this prefabricated
**00:41:56 --> 00:41:56:** housing music.
**00:41:56 --> 00:42:00:** That's it gets into place as it was for Stanford,
**00:42:00 --> 00:42:03:** dropped into place but built top of this.
**00:42:03 --> 00:42:06:** All the building on top and down in the factory.
**00:42:09 --> 00:42:12:** And I, I think it it it that again speaks
**00:42:12 --> 00:42:12:** to,
**00:42:12 --> 00:42:15:** I think a current or a theme in all of
**00:42:15 --> 00:42:15:** these,
**00:42:15 --> 00:42:19:** which is you can't. You can't have the what without
**00:42:19 --> 00:42:19:** the Hal,
**00:42:19 --> 00:42:22:** you know you, you can't design in a vacuum and
**00:42:22 --> 00:42:25:** then figure out what system is the best.
**00:42:25 --> 00:42:27:** It really starts at the beginning,
**00:42:27 --> 00:42:29:** evaluating because you wouldn't want to go.
**00:42:29 --> 00:42:31:** You can't leave it very open,
**00:42:31 --> 00:42:33:** you know. But on the other hand,
**00:42:33 --> 00:42:35:** you can't. With traditional construction either.
**00:42:35 --> 00:42:37:** You choose a construction type of podium,
**00:42:37 --> 00:42:39:** a 3A podium. That's the world.
**00:42:39 --> 00:42:42:** You're living in and you live with those rules the
**00:42:42 --> 00:42:43:** same as these.
**00:42:43 --> 00:42:45:** It's really, I think, as some of these systems are
**00:42:46 --> 00:42:46:** developing.

**00:42:46 --> 00:42:49:** You know, I think the biggest question that developers in
**00:42:49 --> 00:42:53:** particular asking themselves is when is it appropriate to choose
**00:42:53 --> 00:42:54:** one or the other right?
**00:42:54 --> 00:42:57:** And so I think that's when you kind of need.
**00:42:57 --> 00:42:59:** You need the right advisors on that.
**00:43:03 --> 00:43:06:** So we I think we're Rosie.
**00:43:06 --> 00:43:11:** I think we're kind of at leaving time for questions,
**00:43:11 --> 00:43:14:** so do you wanna come help
**00:43:14 --> 00:43:17:** facilitate those a little bit short?
**00:43:17 --> 00:43:22:** So one question in the Q&A was.
**00:43:22 --> 00:43:26:** Do you see any workforce development opportunities coming out of
**00:43:26 --> 00:43:27:** these processes?
**00:43:27 --> 00:43:27:** If
**00:43:27 --> 00:43:32:** I understand the question, I think you're talking about labor
**00:43:32 --> 00:43:33:** workforce like Union.
**00:43:33 --> 00:43:36:** I'd say at least in California,
**00:43:36 --> 00:43:39:** as it relates to workforce agreements,
**00:43:39 --> 00:43:43:** when it when it comes to the low income housing,
**00:43:43 --> 00:43:47:** they're typically required, not necessarily a workforce agreement,
**00:43:47 --> 00:43:52:** but at least prevailing wage is required.
**00:43:52 --> 00:43:53:** I think that's I don't.
**00:43:53 --> 00:43:56:** I don't see it being a a a non or
**00:43:56 --> 00:44:00:** an issue that where you're not going to have workforce
**00:44:00 --> 00:44:01:** agreements.
**00:44:01 --> 00:44:04:** If that's the question. I'm not sure I fully understand
**00:44:04 --> 00:44:05:** the question,
**00:44:05 --> 00:44:08:** but there is a shift a little bit to having
**00:44:08 --> 00:44:10:** left field labor and more shop labor.
**00:44:10 --> 00:44:13:** But there is steel field labor so when I look
**00:44:13 --> 00:44:16:** at a project that we're working on that the $55
**00:44:16 --> 00:44:19:** million project you're probably talking,
**00:44:19 --> 00:44:22:** you know 15 to 20 million of that 55.
**00:44:22 --> 00:44:26:** Is is built in in modular and the rest of
**00:44:26 --> 00:44:27:** it still on site.
**00:44:27 --> 00:44:30:** So you're still talking, you know,
**00:44:30 --> 00:44:32:** 5060 plus percent are probably 70%
**00:44:32 --> 00:44:33:** more are still on site,
**00:44:33 --> 00:44:37:** so I think there's still some work to tapping into
**00:44:37 --> 00:44:37:** that,
**00:44:37 --> 00:44:40:** and that really is your your underground,

**00:44:40 --> 00:44:42:** your foundations, your podium, exterior skin,
**00:44:42 --> 00:44:45:** the the MVP's that are running in for your distribution,
**00:44:45 --> 00:44:48:** those kind of things are still done on site,
**00:44:48 --> 00:44:51:** so those those, if I answered the question,
**00:44:51 --> 00:44:53:** I hope I had. But no,
**00:44:53 --> 00:44:57:** that still would be under any kind of workforce agreement
**00:44:57 --> 00:44:57:** if there is.
**00:44:57 --> 00:44:58:** 1.
**00:44:58 --> 00:45:02:** Well, you know that that I guess makes me think
**00:45:02 --> 00:45:04:** a little bit about.
**00:45:04 --> 00:45:07:** I mean what affordable housing has driven a lot,
**00:45:07 --> 00:45:09:** especially in the modular world?
**00:45:09 --> 00:45:14:** Because of the way the the various wage requirements and
**00:45:14 --> 00:45:17:** so a lot of the some innovation has come out
**00:45:17 --> 00:45:21:** of the the the the labor cost directly right?
**00:45:21 --> 00:45:23:** And but at the same time it's it's a a
**00:45:23 --> 00:45:29:** little bit like it's influencing non affordable housing without prevailing
**00:45:29 --> 00:45:29:** wage.
**00:45:29 --> 00:45:31:** Requirements, and that's something I mean,
**00:45:31 --> 00:45:34:** Dave and I are working right now on a project
**00:45:35 --> 00:45:35:** in Hollywood.
**00:45:35 --> 00:45:39:** That's market rate housing. It's modular and it's still making
**00:45:39 --> 00:45:41:** sense regardless of the the wage scenario.
**00:45:41 --> 00:45:44:** So and and I think that's that's a.
**00:45:44 --> 00:45:47:** That's where I see at least the future going where
**00:45:47 --> 00:45:51:** there's an incubator for some of these technologies.
**00:45:51 --> 00:45:52:** Once the system is learned,
**00:45:52 --> 00:45:55:** they start to be competitive in a in a in
**00:45:55 --> 00:45:57:** a market rate environment.
**00:46:01 --> 00:46:03:** Thanks so another question was,
**00:46:03 --> 00:46:05:** will Katerra come back from their bankruptcy?
**00:46:08 --> 00:46:12:** You know, I, uh, I would be surprised if they
**00:46:12 --> 00:46:12:** do,
**00:46:12 --> 00:46:14:** and I think that you know,
**00:46:14 --> 00:46:20:** and we, I mean, many of us have kind of.
**00:46:20 --> 00:46:24:** At least approached or been approached by Katera and you
**00:46:24 --> 00:46:26:** know at least my opinion.
**00:46:26 --> 00:46:29:** My frank opinion is that they were trying to do
**00:46:30 --> 00:46:31:** everything all at once.
**00:46:31 --> 00:46:35:** You know, at such a high integrated level when really
**00:46:35 --> 00:46:38:** what what most of us are living with is actually

**00:46:38 --> 00:46:43:** a very diverse and complicated commercial real estate environment,

**00:46:43 --> 00:46:47:** and so rolling it all together is a great vision.

**00:46:47 --> 00:46:51:** But it seems it just seems like so high.

**00:46:51 --> 00:46:53:** A bar to achieve so I feel like the what

**00:46:54 --> 00:46:57:** they were trying to do is happening in little pieces

**00:46:57 --> 00:46:58:** in other areas.

**00:46:58 --> 00:47:02:** And you know, I know there's there's additional investment and

**00:47:02 --> 00:47:05:** and a new I guess versions of of approaches to

**00:47:05 --> 00:47:05:** that,

**00:47:05 --> 00:47:08:** but I think it I think it'll take time and

**00:47:08 --> 00:47:11:** I don't think there's going to be one.

**00:47:11 --> 00:47:14:** Or I hope not. 'cause I'll be out of a

**00:47:14 --> 00:47:15:** job I,

**00:47:15 --> 00:47:18:** I'm that there's going to be 1.

**00:47:18 --> 00:47:20:** Kind of entity that can kind of do the whole

**00:47:20 --> 00:47:21:** process.

**00:47:21 --> 00:47:23:** It's really, it's hard because it's ever changing.

**00:47:23 --> 00:47:25:** I mean I don't know what do

**00:47:25 --> 00:47:25:** you

**00:47:25 --> 00:47:28:** think Dave? Well, I I think I mean not answering

**00:47:28 --> 00:47:29:** Nestle directly.

**00:47:29 --> 00:47:31:** The question about Katerra, but you know I'm in the

**00:47:32 --> 00:47:33:** job of risk mitigation.

**00:47:33 --> 00:47:34:** I think we all are right,

**00:47:34 --> 00:47:37:** and so you know, one of the things that we're

**00:47:37 --> 00:47:39:** looking at is you're you're.

**00:47:39 --> 00:47:41:** You're you're putting all your eggs in for I'll go

**00:47:41 --> 00:47:43:** with the modular example,

**00:47:43 --> 00:47:45:** you're putting your eggs in the basket,

**00:47:45 --> 00:47:48:** you're, you're committing to a manufacturer early on.

**00:47:48 --> 00:47:51:** Uhm, and so one of the things that we're doing

**00:47:51 --> 00:47:55:** is we're bonding getting a bond for the entire scope

**00:47:55 --> 00:47:55:** of work.

**00:47:55 --> 00:47:59:** Now everybody knows a bond is isn't the greatest thing

**00:47:59 --> 00:48:01:** because you gotta collect on it,

**00:48:01 --> 00:48:04:** right? But you know another thing we're doing is we're

**00:48:04 --> 00:48:08:** asking these suppliers to provide a letter of credit,

**00:48:08 --> 00:48:11:** and so some of the letter credit is,

**00:48:11 --> 00:48:14:** you know, we're we're moving forward with our spending $150,000

**00:48:14 --> 00:48:15:** on a design phase.

**00:48:15 --> 00:48:18:** Or what happens if that design?
**00:48:18 --> 00:48:20:** You know they don't move into fabrication.
**00:48:20 --> 00:48:23:** Well, I got a letter of credit for $150,000 that
**00:48:23 --> 00:48:26:** I can go get my money back now that doesn't
**00:48:26 --> 00:48:28:** help the project move forward.
**00:48:28 --> 00:48:31:** We got, you know, but at least we're mitigating that
**00:48:31 --> 00:48:34:** risk and so that's something that I think most of
**00:48:34 --> 00:48:37:** the the manufacturers are open to doing because,
**00:48:37 --> 00:48:39:** you know, like I I said before,
**00:48:39 --> 00:48:42:** I don't think any of this technology is new.
**00:48:42 --> 00:48:45:** I think Matt made the comment new technology for mass
**00:48:45 --> 00:48:46:** timber 30 years ago,
**00:48:46 --> 00:48:49:** right? So I mean, in the construction world.
**00:48:49 --> 00:48:50:** I think we move slow,
**00:48:50 --> 00:48:53:** right? So 30 years is new.
**00:48:53 --> 00:48:55:** But none of this is new,
**00:48:55 --> 00:48:57:** it's just maybe new to you and and so some
**00:48:57 --> 00:48:59:** of these suppliers out there.
**00:48:59 --> 00:49:01:** They're used to this. They're there,
**00:49:01 --> 00:49:03:** they know that that there is a little concern,
**00:49:03 --> 00:49:05:** and they're willing to, you know,
**00:49:05 --> 00:49:08:** put up put their money where their mouth is,
**00:49:08 --> 00:49:11:** and and give you a bond and give you a
**00:49:11 --> 00:49:12:** letter of credit to you.
**00:49:12 --> 00:49:15:** Know that show you know that good faith that they're
**00:49:15 --> 00:49:17:** going to be moving forward the project.
**00:49:21 --> 00:49:23:** Rap maybe by saying, you know,
**00:49:23 --> 00:49:25:** if not catero coming back from the dead,
**00:49:25 --> 00:49:28:** you know there's plenty of intellectual property and a lot
**00:49:28 --> 00:49:31:** of brain power that was there that has been distributed
**00:49:31 --> 00:49:32:** throughout the industry.
**00:49:32 --> 00:49:35:** And like Mark, it's gonna happen on smaller scale once,
**00:49:35 --> 00:49:37:** not in a single entity,
**00:49:37 --> 00:49:40:** but well throughout. And so I think we will continue
**00:49:40 --> 00:49:42:** to see innovation and.
**00:49:42 --> 00:49:44:** Uhm, good ideas brought to this.
**00:49:44 --> 00:49:45:** This part of the evening.
**00:49:47 --> 00:49:50:** Thanks, Uhm going back to mass timber.
**00:49:50 --> 00:49:54:** We had a question on how the balconies and cantilevers
**00:49:54 --> 00:49:56:** are achieved with mass timber construction.
**00:49:58 --> 00:50:02:** Yeah, the innovation of certainly cross laminated timber pacifically is

**00:50:02 --> 00:50:05:** that it is that layered weave of of a dimensional
**00:50:05 --> 00:50:06:** lumber,
**00:50:06 --> 00:50:08:** so it has strengthened two directions.
**00:50:08 --> 00:50:12:** So primaries left making your balcony is up down South.
**00:50:12 --> 00:50:17:** I guess then you can adhere a balcony onto that.
**00:50:17 --> 00:50:19:** Cross submitted timber panel and then and you can as
**00:50:19 --> 00:50:23:** long as you can make the appropriate connection from material
**00:50:23 --> 00:50:24:** to material that work.
**00:50:24 --> 00:50:27:** Or you can actually. Mass timber being two directional,
**00:50:27 --> 00:50:30:** you can cantilever those panels over a column,
**00:50:30 --> 00:50:32:** so there's no reason you can't extend beyond a one
**00:50:33 --> 00:50:35:** story column and come back and work computer.
**00:50:35 --> 00:50:37:** I don't know, just forward,
**00:50:37 --> 00:50:39:** but also to this. Uhm,
**00:50:40 --> 00:50:43:** so that's really been. The innovation or what?
**00:50:43 --> 00:50:46:** What cross limited timber as a two directional material has
**00:50:46 --> 00:50:49:** brought to the market is that you can do balconies
**00:50:49 --> 00:50:51:** and you can make it work more like a cast
**00:50:51 --> 00:50:53:** in place or precast concrete structure.
**00:50:58 --> 00:50:58:** Thank
**00:50:58 --> 00:51:03:** you. So we had a question with the added effort
**00:51:03 --> 00:51:07:** in design and pre construction over on site work.
**00:51:07 --> 00:51:11:** Is there a workflow synergy with also pushing modular prefab
**00:51:11 --> 00:51:15:** toward higher thermal performance methods like Passivhaus?
**00:51:15 --> 00:51:19:** Those approaches also typically have a front loaded workflow.
**00:51:22 --> 00:51:25:** Yeah, I I think UM.
**00:51:25 --> 00:51:29:** So there is more work up front,
**00:51:29 --> 00:51:33:** right for sure, and there's also different people involved,
**00:51:33 --> 00:51:37:** so in that respect I think it's it's like any
**00:51:38 --> 00:51:43:** design process that's trying to do something a little bit
**00:51:43 --> 00:51:44:** more.
**00:51:44 --> 00:51:50:** The interesting thing speaking specifically to passive houses that you
**00:51:50 --> 00:51:54:** know or the criteria is that the it's a lot
**00:51:54 --> 00:51:54:** easier.
**00:51:54 --> 00:51:58:** To manufacture something you know with with better,
**00:51:58 --> 00:52:00:** I guess more precision and better results.
**00:52:00 --> 00:52:04:** And that's really what you need for particularly for the
**00:52:04 --> 00:52:07:** exterior skin of the building and the insulation,
**00:52:07 --> 00:52:10:** right? 'cause you can design anything on paper?

**00:52:10 --> 00:52:12:** Will it function that way?
**00:52:12 --> 00:52:16:** And well, if you can prototype it and mass produce
**00:52:16 --> 00:52:16:** it,
**00:52:16 --> 00:52:20:** there's a much better chance that it's going to perform
**00:52:20 --> 00:52:21:** as designed,
**00:52:21 --> 00:52:25:** which is that that gap sometimes between the the design
**00:52:25 --> 00:52:26:** and the reality.
**00:52:26 --> 00:52:28:** So I don't know that directly answers the question.
**00:52:33 --> 00:52:36:** Thank you and then the last question.
**00:52:36 --> 00:52:40:** The Q&A was have any of the presenters combine modular
**00:52:40 --> 00:52:44:** prefab projects with other novel project execution approaches like integrated
**00:52:44 --> 00:52:46:** project delivery?
**00:52:46 --> 00:52:49:** If so, how does the risk distribution reward distribution work
**00:52:49 --> 00:52:51:** with factory assembled components?
**00:52:55 --> 00:52:55:** Can
**00:52:55 --> 00:52:57:** you speak to that Dave?
**00:52:57 --> 00:52:58:** I have some thoughts but
**00:52:58 --> 00:52:59:** I would like to hear you.
**00:52:59 --> 00:53:02:** I don't. I don't know that we've really done it.
**00:53:02 --> 00:53:05:** I PD. But I would say it's all of quasi
**00:53:06 --> 00:53:07:** ipda if you will,
**00:53:07 --> 00:53:10:** right? I mean, I think that's kind of.
**00:53:10 --> 00:53:14:** The idea of I think I mentioned earlier is I
**00:53:14 --> 00:53:18:** think the the best method is to get your architect.
**00:53:18 --> 00:53:21:** Your your suppliers, whether it be precast or modular or
**00:53:22 --> 00:53:22:** mass timber,
**00:53:22 --> 00:53:26:** whoever it is and your contractor on board up front.
**00:53:26 --> 00:53:30:** And so regardless of who holds the contract or how
**00:53:30 --> 00:53:31:** it's it's,
**00:53:31 --> 00:53:35:** it's contracted it. I think the it's ultimately is a
**00:53:35 --> 00:53:36:** quasi IPD,
**00:53:36 --> 00:53:40:** right? I mean we all have to work together to
**00:53:40 --> 00:53:43:** to to create that design in order for it to
**00:53:43 --> 00:53:45:** be successful.
**00:53:46 --> 00:53:48:** Yeah I I would echo that completely.
**00:53:48 --> 00:53:51:** I think I I've sat in meetings thinking like this
**00:53:51 --> 00:53:53:** feels just like an IPD project,
**00:53:53 --> 00:53:56:** you know, or or wow this is.
**00:53:56 --> 00:54:00:** Design assist or sometimes literally design build and so I
**00:54:00 --> 00:54:03:** think that I think that but what?
**00:54:03 --> 00:54:06:** What I haven't seen though kind of like David saying,

**00:54:06 --> 00:54:09:** is literally under that rubric or whatever.
**00:54:09 --> 00:54:12:** Where there's a uh where the risk and rewards are
**00:54:12 --> 00:54:14:** specifically called out,
**00:54:14 --> 00:54:16:** and I don't know I,
**00:54:16 --> 00:54:19:** I know that there's always you know.
**00:54:19 --> 00:54:22:** I mean, there's most construction contracts have penalties in them,
**00:54:22 --> 00:54:26:** right? But usually the reward is not getting a penalty.
**00:54:26 --> 00:54:27:** I don't know.
**00:54:33 --> 00:54:37:** Sorry, we have one more question in the chat.
**00:54:37 --> 00:54:40:** And that is sorry, give me one second.
**00:54:40 --> 00:54:44:** Have you seen any issues with obtaining insurance for GC's
**00:54:44 --> 00:54:46:** doing large modular project?
**00:54:46 --> 00:54:50:** Being that mod? Insurance can go.
**00:54:50 --> 00:54:54:** Out of business, sorry. I think there was a spelling
**00:54:55 --> 00:54:55:** error.
**00:54:55 --> 00:54:57:** Product timely delivery, suffered damage,
**00:54:57 --> 00:55:03:** fire, etc. Does that make sense?
**00:55:03 --> 00:55:05:** Sorry, let me just start over.
**00:55:05 --> 00:55:08:** Have you seen any issues with obtaining insurance critisise doing
**00:55:08 --> 00:55:09:** large modular project?
**00:55:09 --> 00:55:13:** Being that they can go into business or their suffer
**00:55:13 --> 00:55:13:** damage,
**00:55:13 --> 00:55:17:** fires, etc. I believe that's the.
**00:55:17 --> 00:55:17:** Question
**00:55:17 --> 00:55:23:** I I don't think I've seen anybody having problems getting
**00:55:23 --> 00:55:24:** insurance.
**00:55:24 --> 00:55:27:** You know we. Yeah, I don't.
**00:55:27 --> 00:55:30:** I haven't seen anybody having problems getting insurance.
**00:55:32 --> 00:55:35:** You know, I think that the the I think your
**00:55:35 --> 00:55:38:** your issue of going out of business I think is
**00:55:38 --> 00:55:41:** what I was ultimately talking about with getting a bond
**00:55:41 --> 00:55:44:** and one of the things that I had spoke with
**00:55:45 --> 00:55:46:** a bonding company.
**00:55:46 --> 00:55:50:** Was their thoughts, at least at least this one bonding
**00:55:50 --> 00:55:52:** company over one modular manufacturer?
**00:55:52 --> 00:55:56:** Was they their preference? Would be to help.
**00:55:56 --> 00:55:59:** That modular company limp through a project and get it
**00:55:59 --> 00:55:59:** built.
**00:55:59 --> 00:56:01:** If that were if they were to be,
**00:56:01 --> 00:56:04:** you know, on the edge of going out of business
**00:56:04 --> 00:56:07:** because it in their mind it would be cheaper to

**00:56:07 --> 00:56:09:** finish the project and it would be to try to
**00:56:09 --> 00:56:12:** get someone else new because you get someone else knew
**00:56:12 --> 00:56:14:** you're you're essentially starting over.
**00:56:14 --> 00:56:15:** So for at least from,
**00:56:15 --> 00:56:18:** uh, you know I, I'm not a insurance company or
**00:56:18 --> 00:56:20:** a bonding company and know how they think,
**00:56:20 --> 00:56:23:** but that's that's what I was told is that if
**00:56:23 --> 00:56:26:** it were to get to that point that they would
**00:56:26 --> 00:56:27:** rather.
**00:56:27 --> 00:56:29:** They would rather finish the job than try to start
**00:56:29 --> 00:56:29:** over.
**00:56:30 --> 00:56:34:** Yeah, from what I've seen in various projects,
**00:56:34 --> 00:56:37:** the insurance isn't a problem at all.
**00:56:37 --> 00:56:41:** The you know the the funding sources though for projects
**00:56:41 --> 00:56:46:** are have been I think maybe the bigger issue depending
**00:56:46 --> 00:56:50:** on the kind of project you know and and it's
**00:56:50 --> 00:56:52:** degree of public money or not.
**00:56:52 --> 00:56:54:** And and there's definitely been.
**00:56:54 --> 00:56:59:** I feel like the the the the capital has been.
**00:57:01 --> 00:57:04:** Uh, how? How can I say the the slowest to
**00:57:04 --> 00:57:08:** come to the table and but I don't blame them?
**00:57:08 --> 00:57:09:** I mean if I had capital,
**00:57:09 --> 00:57:12:** I would be really reluctant to to to fund new
**00:57:12 --> 00:57:15:** things when I could fund existing things.
**00:57:15 --> 00:57:18:** But and I think that speaks a little bit to
**00:57:18 --> 00:57:19:** hey,
**00:57:19 --> 00:57:22:** we just need to see enough of these projects happen.
**00:57:22 --> 00:57:25:** They work, they're successful, and then then all of a
**00:57:25 --> 00:57:27:** sudden it's not a alternate technology.
**00:57:27 --> 00:57:31:** It's just another technology. It's just another construction type and.
**00:57:31 --> 00:57:35:** I feel like that's very much where we're on the
**00:57:35 --> 00:57:38:** edge closer than with some than others.
**00:57:38 --> 00:57:41:** But where we are with a lot of these column
**00:57:41 --> 00:57:42:** innovative construction types,
**00:57:42 --> 00:57:43:** I think they're
**00:57:43 --> 00:57:47:** getting the the. The lending industry is getting more understanding
**00:57:47 --> 00:57:48:** of what it is,
**00:57:48 --> 00:57:49:** right? 'cause they're used to.
**00:57:49 --> 00:57:52:** We don't pay until we see it on site where
**00:57:52 --> 00:57:55:** you gotta flip a little bit where you're paying before

**00:57:55 --> 00:57:57:** it's actually installed on site.
**00:57:57 --> 00:58:00:** That's I think that's the difference in.
**00:58:02 --> 00:58:03:** So actually
**00:58:03 --> 00:58:06:** it was a question in the Q&A our lenders comfortable
**00:58:06 --> 00:58:08:** with funding projects with these technologies.
**00:58:08 --> 00:58:10:** Someone else also asked, you know,
**00:58:10 --> 00:58:13:** are you having issues getting insurance for mass timber,
**00:58:13 --> 00:58:14:** modular or not?
**00:58:17 --> 00:58:19:** Yeah, I would say insurance hasn't been an issue,
**00:58:19 --> 00:58:22:** at least on with my clients and the projects that
**00:58:22 --> 00:58:26:** we're working on really haven't seen that as a as
**00:58:26 --> 00:58:26:** an issue.
**00:58:26 --> 00:58:29:** And I know I, I know we're a little bit
**00:58:29 --> 00:58:32:** short or maybe even out of time,
**00:58:32 --> 00:58:35:** but I wanted to just throw one thing out there.
**00:58:35 --> 00:58:37:** For David Matt, you to answer,
**00:58:37 --> 00:58:40:** which is what do you see happening next?
**00:58:40 --> 00:58:43:** I'll answer really quick. You know what I see happening
**00:58:43 --> 00:58:45:** next is prefabrication through 3D printing.
**00:58:45 --> 00:58:48:** I'm seeing that start to become a thing.
**00:58:48 --> 00:58:50:** You know? What do you guys seem?
**00:58:52 --> 00:58:56:** I'd say in general I see a lot more in
**00:58:56 --> 00:58:59:** the market of asking questions.
**00:58:59 --> 00:59:02:** You know this question that we're trying to answer today.
**00:59:02 --> 00:59:04:** When can I do it?
**00:59:04 --> 00:59:07:** What should I do? Who can I talk to?
**00:59:07 --> 00:59:10:** Write it? There's a lot more interest in alternative methods,
**00:59:10 --> 00:59:13:** and there was before, and it seems to be mostly
**00:59:13 --> 00:59:14:** driving.
**00:59:14 --> 00:59:17:** How quickly can, at least in the Southern California market,
**00:59:17 --> 00:59:19:** how quickly can I get it to market?
**00:59:19 --> 00:59:21:** You know, what can I do?
**00:59:21 --> 00:59:24:** That's going to bring it to market faster?
**00:59:27 --> 00:59:31:** For what's next? We see a real focus on sustainability
**00:59:31 --> 00:59:33:** with developers is you know,
**00:59:33 --> 00:59:36:** how does this affect. Uhm?
**00:59:36 --> 00:59:40:** My project and how will it be perceived by the
**00:59:40 --> 00:59:41:** end users?
**00:59:41 --> 00:59:44:** I think people are clamoring understanding that highly sustainable projects
**00:59:45 --> 00:59:47:** are important and your materials aside,
**00:59:47 --> 00:59:50:** there's a lot of. Savings and streamlining that's done with

**00:59:50 --> 00:59:54:** off-site fabrication that can relate to sustainability,
**00:59:54 --> 00:59:57:** even concrete. You know, there's you can heat the form
**00:59:57 --> 01:00:00:** work and reduce a lot of the cement and so
**01:00:00 --> 01:00:00:** in.
**01:00:00 --> 01:00:02:** That way you're pulling carbon out of out of the
**01:00:02 --> 01:00:03:** process,
**01:00:03 --> 01:00:06:** so I think there's a lot of those to argon.
**01:00:06 --> 01:00:09:** Through any of these, you know.
**01:00:09 --> 01:00:11:** Steel component panels. Master of course,
**01:00:11 --> 01:00:14:** highly sustained income. All of these are going to start
**01:00:14 --> 01:00:18:** integrating because everybody is going to start asking for it
**01:00:18 --> 01:00:21:** and I really think that having an accounting of all
**01:00:21 --> 01:00:24:** the material in your project is going to be critical
**01:00:24 --> 01:00:26:** because everybody cares about it.
**01:00:26 --> 01:00:27:** The developer, the end user.
**01:00:27 --> 01:00:29:** I care about it as designers,
**01:00:29 --> 01:00:32:** you know. Positively affecting the built environment,
**01:00:32 --> 01:00:34:** so I see is next.
**01:00:36 --> 01:00:38:** Sorry there was one more question that just came in
**01:00:39 --> 01:00:42:** about whether you're seeing anything being constructed with shipping containers.
**01:00:42 --> 01:00:43:** Any final thoughts
**01:00:43 --> 01:00:46:** on that? Yeah, I can speak to that.
**01:00:46 --> 01:00:49:** We had looked at that for a project and I
**01:00:49 --> 01:00:52:** do see I do see that the issues are mostly
**01:00:52 --> 01:00:53:** scale,
**01:00:53 --> 01:00:55:** so if you look around at least LA,
**01:00:55 --> 01:00:57:** that's the city. I know the most.
**01:00:57 --> 01:01:00:** You're close to a port so that works.
**01:01:00 --> 01:01:03:** You have local manufacturers, but typically they can't do buildings
**01:01:03 --> 01:01:04:** that are.
**01:01:04 --> 01:01:06:** You know, their sweet spot is maybe.
**01:01:06 --> 01:01:09:** For housing 40 units or less,
**01:01:09 --> 01:01:11:** at least right now.
**01:01:13 --> 01:01:16:** Well, thank you to all three of you.
**01:01:16 --> 01:01:19:** This was a wonderful session again to our attendees.
**01:01:19 --> 01:01:22:** Thank you for joining us on this Friday afternoon.
**01:01:22 --> 01:01:24:** We will share the recording up around.
**01:01:24 --> 01:01:27:** After this. It will also live online knowledge finders,
**01:01:27 --> 01:01:30:** so if you remember it will be there along with
**01:01:30 --> 01:01:32:** any of our past webinars,

**01:01:32 --> 01:01:34:** so I hope you'll check them out.
**01:01:34 --> 01:01:37:** But again, thank you to our panelists and I hope
**01:01:37 --> 01:01:38:** everyone has a
**01:01:38 --> 01:01:40:** wonderful weekend here.

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