



# 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 4:45,  
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 KTG Y 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

00:10:14 --> 00:10:17: 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

00:10:24 --> 00:10:25: 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 KTG Y 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  
00:12:40 --> 00:12:42: reviewing,  
00:12:42 --> 00:12:46: what they're not, that's true.  
00:12:46 --> 00:12:49: We really have changed the way for modular and off-site  
00:12:49 --> 00:12:53: projects where that it has changed the way we document,  
00:12:53 --> 00:12:57: and we also realize 'cause our clients realize that unless  
00:12:57 --> 00:12:58: the scope is clear to the people who are building  
00:12:58 --> 00:13:01: it orbiting it,  
00:13:01 --> 00:13:04: it's hard to get to realize actual cost savings.  
00:13:04 --> 00:13:07: 'cause where did where does my work start as a  
00:13:07 --> 00:13:09: subcontractor and and stop and so?  
00:13:09 --> 00:13:10: You want to make sure you're not paying twice.  
00:13:10 --> 00:13:12: Obviously thinking  
00:13:12 --> 00:13:14: one of your slides you have.  
00:13:14 --> 00:13:15: That colored document I think,  
00:13:15 --> 00:13:21: or something similar. You're  
00:13:21 --> 00:13:22: right, I do, yeah. I think,  
00:13:22 --> 00:13:26: well, this is. This is a.  
00:13:26 --> 00:13:27: It's a presentation version, but really you know the the  
00:13:27 --> 00:13:29: the the site work,  
00:13:29 --> 00:13:31: what's built on site is documented,  
00:13:31 --> 00:13:34: it's just a parameter in Revit.  
00:13:34 --> 00:13:36: It's not very complicated. What's what the modular piece?  
00:13:36 --> 00:13:39: And then the the third phase.  
00:13:39 --> 00:13:42: Really we're calling the zip up or the cladding,  
00:13:42 --> 00:13:44: or however you want to think about it,  
00:13:44 --> 00:13:46: 'cause there really aren't two phases.  
00:13:46 --> 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 you 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  
00:22:21 --> 00:22:23: 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

00:23:45 --> 00:23:50: prefabricated wood elements that are massive and by being

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

00:24:01 --> 00:24:02: destruction

00:24:01 --> 00:24:02: type then?

00:24:02 --> 00:24:06: Wood construction adopted by the IBC 2021 and early

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 absorption,

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 steel,

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 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 Katera 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 Katterra, 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 criticise 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  
00:59:45 --> 00:59:47: sustainable projects  
00:59:47 --> 00:59:50: 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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