OK, good afternoon all and welcome to your light worker centers monthly webinar today. Our speakers will be covering construction innovation and I will hit it over to them in one moment. Just a few housekeeping items we are recording this webinar and it will be available after we will share it on knowledge Finder, but I will also email it to all attendees. And we will have time for Q&A. Probably around 2:45 to 4245, so as questions arise, please feel free to put them in the Q&A box and I will monitor those and pass them over to our panelists. So over to you, Mark, thanks. Thanks Rosie. So I'm Mark Oberholtzer, architect with KTGY out of the downtown LA office and very involved in mixed use, urban infill projects and also, you know very much interested in in different construction, typology's and and and their uh, their guess opportunities for design joining me. We've got David Edmondson from CW driver at they want to introduce. Yourself. Thanks mark. My name is David Hamilton, project executive for CD Driver CD Driver is 102 year old company in Southern California. For me personally, 26 years in the business and.
Have really touched just about every industry. We have a pretty large focus on moving the volumetric modular projects forward and have a couple projects moving forward with Mark and really excited to like Mark said to on on this new adventure of and I don't. I guess it's not so new but newer for for CW driver, but on the volumetric modular projects and also joining the team is a structural engineer. Matt Timmers. I am at Timmers on the stretch function ear with Johnny Martin and Associates are offices in LL. We have an office in Oakland, CA as well. Like Mark and David, very interested in innovative construction techniques, including modular mass, timber, precast paralyzed metal studs. So happy to share our experience with you today. Thank you. And I'm going to share my screen where if you have questions, we're going to have a Q&A at, like in 40 minutes. But meanwhile you can be populating the chat with those and we'll be looking at him as a group and and hit as many as we can. We've got this and, and Matt alluded to it, we've got this presentation, which we're going to, you know, kind of flipped through. Covering for modular, panelization, mass timber. And also structural precast and kind of and with kind of pros and cons state of the art and what we're seeing in each of these areas. And I think I think the three of us would agree that there's a multiplicity of technologies, some of them are new, some of them are older, they are in different states of development. But what we're hoping to do is show you what
we're working on and give you some insight into when it makes sense to consider.

Going in a direction that uses one of these innovative technologies.

So the first one of these is modular biometric, and there is wood and steel and you know we're not so much describing the basics, 'cause I feel like you know. Probably many people know it, but kind of trying to dig into a little bit more of the experience right and this this project here was that, at least for me, the first steel modular project in Westlake in LA.

Permanent supportive housing, but really, that has led to over the last five years for us with a whole bunch of different partners.

Working on a number of steel modular projects, hospitality projects. Perfect fit. You know. Site built versus the modular rooms kind of closed the door.

All the finishes come in there. What we've seen, interestingly, is a real evolution in in manufacturers and delivery methods and a greater understanding of the logistics and and Dave, I wanted to ask you, you know, could you talk a little bit about the effective logistics?

As a effects of modular feasibility for project, yeah I think I I was gonna say before you asked me the question that I think there's a fear. A little bit of volumetric modular that it's a some new technology,

but it really isn't new IT might be newer to the United States, but it's been. It's been pretty well used outside of the US and it's quite. There's quite a few projects going on currently as it relates to logistics I I think.
There's a it the the simple part is you have. You need a lot less space.

Uhm? But you do need space for a crane. You do need space for lay down of modular units, whether they be a, uh,

we you know we like to do just in time delivery. But as you know, depending on how far your trucking, there's some modular manufacturers that are around the United States.

There's some in Canada, there's some overseas, so depending on where you're getting them, there is a local manufacturer here in California, and so we can get them within a couple hours. There's another one in in Texas that we can get him in Southern California the next day, so those kind of where we're not looking to build yards to store.

But if you're getting them from China, you're going to need a storage yard to store all those boxes ahead of time. 'cause they're going to need to come in and be trucked to the site.

So you're you're taking them off a truck and putting them on. It's on the building 'cause you can put. You know, tend to. 1010 units plus 10/15 a day. And so they go pretty fast.

So when you're talking about a building of this size within a couple months, you your buildings erected after after you get the podium built.

And I think one thing that you know. One thing that this this particular hotel project speaks to is also, and this is true I think, and Matt correct me if if this in the case, but really all of these typologie's we have.

Yeah you can use them low rise,
but they do. They do offer a pathway to sorta mid rise and that particularly I mean, all of us are the three of us are in California and a lot of the work is in LA and that has, you know, has a need for mid rise with given the. Sort of regulatory environment encouraging density in infill sites, but but without projects, always being able to take the costs of a concrete precast concrete type one structure or some kind of steel, you know, red iron steel, so you know this project is low rise. Hope on Alvarado, it's really the first one that we did. It finished and you know truthfully it took longer than a typical podium because. We kind of learned by doing and the we is the manufacturer, the contractor, the architects and all the consultants. I think that we had a different engineer for the modular versus the site built right and and Matt I wanna know what you think about that. We think it's a mistake to have separate engineers. Like you always want to create a collaborative environment, but it's not always possible when you have different elements and you know sometimes egos, do get in the way and fortunately and when really you want to reach across that island, bridge the gap and ultimately build the best building as quickly as you can with the team you have. I think that this, you know, Speaking of teams in this project, like I said, was a learning experience. These three same team or variations of the team are with the exception of the general contractors are under construction simultaneously and and see to be driver is building hope on Hyde Park. Another one of these so it kind of went from the slides
a little bigger. Jackson gosh yeah,
I sure can. And and and this is kind of
a a little bit of a hey,
this worked. We learned lessons and were were applying.
Unlike most things you learn in life,
you get were really applying those lessons and trying to
profit by them so.
This worked. We learned lessons and were applying.

Let me go there. I hope that helps a little

So this is the one that CW driver is building

And and could you comment a little bit?

Dave on the the the where the manufacturer plugs in

at
what point typically, so our recommendation is.
You hire A or. When I say you,
I mean the developer hires an architect,
hires a general contractor and hires the modular supplier at
the same time.
I think there's a value in bringing us all in
together to collaborate.
I think probably the message I was going to give
in this whole presentation.
My whole thought is you're shifting some of that mentality
of we get it partially designed,
will figure it out in the field.
2. We need to do a lot more collaboration in
design and figuring it all out up front.
What that means ultimately, as you get the back savings,
you know faster, cheaper in the field.
But it takes a little more effort upfront and and
I don't mean necessarily that it's a lot more effort,
it's just you need to have your team together.
At least in my opinion as early as possible so
you're all working together.
So to go back to the example of having two
separate engineers,
you're going to have an engineer that's putting some design
together on those modular.
Boxes because they are each manufacturer has their own approach.
So you have to have that engineer that's designing the modular box at the same time that you're built. You have your engineer designing the structure because there's also two approval processes. You have a state approval, at least in California, you have a state approval for the modular, and you have a local authority. You know, in this case, Los Angeles Department of Building and safety that is approving the structure, meaning the foundations, the the podium, the if there's a concrete core, and some. And with here, in a seismic zone, you've gotta transfer. And I'm maybe speaking outside my expertise, Matt. But you gotta transfer those loads from that concrete core for those seismic loads from the concrete core to the outside of those, those modular buildings and and get that that shear transfer correct? Yeah, it's certainly an understanding of coordination and really working together knowing what loads you're expecting and drawing lines on who's doing what and who's responsible for making that connection or making the dragline to the wall and who's ultimately responsible for the concrete core. The engineer of record. Just putting putting scope in the right camps at the right time, yes, ultimately it solves you. If it resolves the having to redesign or I thought we were doing this and and do it all at the same time. Design it once you know one of these conversations you know, I would say two or three years ago.
A lot of the conversation with modular or any off-site construction was how old does the local jurisdiction look at this? How do they plan check it? And that conversation really has pretty much gone away because most most major cities or municipalities kind of know how to do it. You know, if they haven't done it a lot, they've seen others that have done it. So I hear much less about how we do. We plan check this and that's kind of going away as an issue, at least from what I'm seeing. I think they do that Mark is what is from your side as the design side is something that makes that very clear is what you what KTGY does on their documents. It makes it very clear there's a color document that says this color is on site work. This color is is factory work, so it's very clear not only to the bidders, but it's also very clear. We really have changed the way for modular and off-site projects where that it has changed the way we document, and we also realize 'cause our clients realize that unless the scope is clear to the people who are building it orbiting it, it's hard to get to realize actual cost savings. 'cause where did where does my work start as a subcontractor and and stop and so? You want to make sure you're not paying twice. Obviously thinking one of your slides you have. That colored document I think, or something similar. You're right, I do, yeah. I think, well, this is. This is a.
It's a presentation version, but really you know the the site work, what's built on site is documented, it's just a parameter in Revit. It's not very complicated. What's what the modular piece? And then the the third phase. Really we're calling the zip up or the cladding, or however you want to think about it, 'cause there really aren't two phases. There's not on site off-site. There's on site off site and then completion or zip up, so there's really. That third phase, and so we. That's a lot of where this this third phase is where the scope gets confusing, potentially to subcontractors bidding. But Speaking of costs, you know we've we have, you know, all of us, and probably many of you have listened to a lot of conversations, and I'm like really happy to have a kind of in process cost estimate that day's been putting together on a modular building. Dave, you wanna talk a little bit about this? So I'll first caveat this with you know, it's like when, how much does a car cost, right? So every building's got its own unique, unique. Features that affect the price and So what this is showing that Mark and I are working on along with others is kind of trying to create this. Kind of presentation like this is what it could be. So what you're seeing here is, I think you get from a cost perspective between a Type 3 conventional build wood frame project versus volumetric modular probably zero. I'll go zero to 15% difference and in cost, meaning modular being cheaper. It's to it, we don't see it being more. We see it being less,
but there's a lot of parameters on why it would be somewhere between 0 and 15 so. This one in particular is on the higher end. One of the main reasons is because it's a prevailing wage project, and So what you're seeing is, you know you're shifting a lot of that labor that would be in the field paying prevailing wage rates, and you know California prevailing wage rates are pretty high, and shifting it to a factory wage rate that is not subject to prevailing wage. So you're, you're. You're just that alone. You're there's a quite a bit of savings between prevailing wage and open shop. So then you take the fact that you're shifting all that to shop labor. That's where you're getting your biggest savings here so, but you, you're typically going to see regardless of project, somewhere in the zero to 15% range, and I say zero to 15% because that's hard cost you're. You're clearly going to save on soft costs as well, because I don't know if you got the next slide. That's kind of a very. Broad look at schedule is if we're looking at a similar sized project that would take you know 16 to 18 months to build conventionally in the field is taking between 12 to 14 months to build it and modular and so you're not only saving on the general conditions cost of of four months of having a contractor out for for additional four months on a job, but you're also got the soft cost savings your carry costs for for a loan or the. Quicker to bring it to market and start generating revenue or even even for me. It's cheaper because I you know on a conventional build I would probably have three to four superintendents on a
project where a modular.
I could probably get away with two.
So even then, even even the overall general conditions are reduced because I need less money,
less manpower to manage the project.
And I think from from a a cost perspective,
there's also that kind of leads us.
Leads us into the next type panelization because there's a couple ways to realize value.
One is obviously the actual cost of parity,
right type 3 to a modular or some other version right that compares or competes with Type 3,
but again, the other thing is to create a little bit more value,
and that's something that panelization can do.
Again, as I kind of alluded to that mid rise space,
this is a project. In Salt Lake City that we have under construction right now,
and it's it's two buildings.
A 12 story and an 8 story building,
all with steel stud prefabricated load bearing steel stud prefabricated
so it's a way to get above that 85 foot building code height limit on Type 3 podium without.
Entering the world of you know, a high rise structure that is really meant and efficient to go.
20 or 30 storeys. That's when you realize value from that system.
So where does the mid rise fit in?
Could be modular, like the hotel we just looked at earlier or could be.
Could be the panelization in a steel stud scenario for these two buildings,
so this we're seeing more and more of and there are different versions of this.
There's this is another project in Salt Lake City that's nearly complete now.
The exchange nine stories penalized and this one was
There's a number of proprietary steel bearing steel systems we have worked with, President. This one happens to be Infinity and you know. And there's also buildings that don't use a proprietary system but are just, you know, engineered, straight up and and Matt. I don't know, maybe you could speak to that a little bit. Yeah, I think it's important vacation time and there's a couple of different securities times of projects to being the private area or two proprietary options you just mentioned, but then you know these can be formed. Specified load bearing studs as well. You know there's a number of manufacturers even into Southern California alone, but throughout the US that is able to take performance specifications and drawing structural drawings and then built panelized versions of all those elements. You know, walls where they belong and it's the same precision. Manufacturing, you know, early loaded shop drawings you know measure twice, cut once, but it's done built. It doesn't need to be, you know, framed into these. Sometimes those proprietary systems have constraints you need to work within those, but if you want the flexibility or you want the ability to sort Slater and not get married right away to a particular system of manufacturer, then this is the other route. Is that you have it non proprietary open source and performance specification. And in this I'm also. I also think there's a big difference if you're in
a seismic zone too,
right? Because these projects are in Utah,
there's, you know, California is pretty different,
and so and I, I think all of these column
construction,
innovative or alternate technologies. They obviously,
especially in a seismic zone,
really have have to prove themselves and have specific
approaches.
So there's, I guess shades and variations.
Is that a good way to put it,
Matt?
Correct, yeah, the same manufacturer that can produce very
structure
east of the Rockies will have trouble getting higher than
six or five stories West of the Rockies,
though you gotta get to know where your jurisdiction is
as well and and play to the strengths of the
manufacturer and that also ways into the decision on whether
you go open source number,
price or if you if you do get married.
Depending on what kind of building you're trying to build
and what you can build where you are,
and
from a builder's perspective, I like the idea.
Of design Bill put it all in,
put it all in the one manufacturer and installers hands
so there's not a a difference of opinion from engineer
to engineer of how to how to put it together.
You know, that's that's my perspective.
But also, you know, I also say that the value
of this is it's being fabricated.
While you were doing some of the on site work
similar to like modular,
if you're building. If you got to go in your
basement,
if you got a basement or you're building a podium,
you're fabricating the walls outside while you're doing the on
site work so.
You can't wait until you start doing the on site
work to start to get your fabricator on though,
so 'cause those things have to be done ahead of time,
'thats the value of this is you're you're saving a lot of from a builder's perspective,
you save a lot of time because you're you're building off site, which is kind of all of these scenarios from most part,
and you know, from a design perspective what I what I notice is the critical path shifts around in in offsite where there's an offsite technology where really the you know getting the transformer set.
Might become the critical path, whereas in a conventional built it isn't.
So the in order to in order to reap the benefits, you kind of have to pivot your thinking a little bit.
So OK, Now what controls the schedule 'cause it might be something different than it used to?
Yeah, it's an interesting point, so we're looking at things like modular elevators where they're pre fabbed.
Elevators were looking at precast stairs, things like that where we don't want to be waiting for the elevator to get installed won't be waiting for steel stairs.
The other, the other components happened so fast in the field.
We want those. We want the elevator and the stairs to not become the critical path right? Deferred submittals seem like a good idea until you realize their time, right? OK, so let's move on to mass timber, which I I feel like it's kind of the the newest one of these and and and it really is new because it's suddenly useful now right?
With with really respect to the changes in the building code and you know kind of.
Excitingly Matt has been involved literally in in the code
changes at the forefront of writing some of this.

So you want to kind of give us a little?

Overview Map yeah

those not familiar 10 second review mass timber is component

defined as wood elements that are massive and by being math

here or is this some calculatable fire and that fire

resistance has allowed master into a larger scale of destruction

Wood construction adopted by the IBC 2021 and early adopted

by an updates on the West Coast already come in

from Utah all the way to California.

Are construction types for C will be in four A

that permit timber buildings to be built at 9 stories,

12 stories or up to 18 stories maximum with different variations of absolution,

non combustive protection. So like Mark said,

this is a recurring theme,

it's really. Opened up the the range of building heights between 85 feet and 100 and 12180 feet now to

something other than than steel and concrete and wood.

Is there plays a role obviously in the sustainable city,

depending on whether it's for C or 4B,

you get to see some of that wood,

and there's a real sales pitch and steady component that goes with this and then type 4A is completely encapsulated

but still speeding up construction.

Provided the right pre fabrication and pre planning processes are

ahead of construction.

So there's also that benefit for type 4A.

At the next slide just,

I think if you want to,

yeah. Take one look the way I like to think

about mass timber is.

It's really wouldn't freak out.

You can treat it the same way.

The requirements for pre coordination and pre design are the same As for precast.
It needs to be thought of before you hit the ground. You can't wait until things were happening on site during construction. But because it is larger members, it's it's faster and you're doing 2 days at once. You know be columns, go up, beams span between them and then these planks come out and you're laying out a lot of floor at one time, potentially twice as fast as cast in place construction.

So we met and I had been collaborating on a project. You know, basically a 12 Storey timber tower and this really came out of our working with a client in a site in Korea Town in LA which had unlimited height but a limited budget. And really the yield that we could get were, you know it's housing was, you know we couldn't get more than 120 units in a podium. Type 3 podium, very dense is the best we could do. Unlimited height, plenty of FAR. It was crazy to leave that on the table. We said, hey, look at modular no. No, we don't wanna look at modular. Look at mass timber. We have been burnt by innovative. We don't want to do it and we said we kind of looked at each other, said, well, we'll do it, you know, so we're right in the process of designing engineering and we're almost to the costing part of this to prove it out. Just like. Just like Dave was showing on the modular. So because we understand that taking that first step can be a little bit. You know, people can be hesitant, development teams can be hesitant. Timber has been used a lot on office building or
I say a lot fairly.

It's not unusual for office buildings because the spans are similar to steal, but we really dug into what would this mean for a housing project, and I think the conclusion that we collectively have come to is you actually end up using the most efficient system for housing where the spans really don't need to be. That great is actually a beamless system where you just have plank in a column.

And and met you and I guess, explain that a little bit better than I did. Yeah, yeah, the reasons that mass timber has such momentum behind it is there. I wouldn't call them new, but within the last 30 years different products have been developed that have different properties. It's not the same as stick frame lumber.

You know where everything is 1 directional. Now you have cross laminated timber panels, which is basically a weave of dimensional lumber adhered together with with glue and these can act as diaphragms. They have in plane shear capabilities that takes off, you know plywood sheeting or concrete topping out of the mix.

If you don't need it also allows the panels to span in two directions so you have the ability to have a longer span. In this case we've got a 10 by 15 grid or 10 by 13 grid.

Where the panels are spinning in the long direction to the to what I would call it a column strip. A shorter direction column strip and in that way there are no beams and you start to really be able to compress your floor to floor heights, which is obviously a material saving on exterior skin. But it also makes everything more akin to cast in place construction and other competitive Type 1.

Charts, and we're typically seeing a high rise building.
And that's we're also, you know, I, as Matt mentioned, there's a significant sustainability aspect.

There's also, we are. We're looking at a for some coastal areas.

Buildings that have typically have pretty deep pile foundations.

The whole building is a lot lighter, so there's some inherent advantage from a foundation system in keeping the building lighter in, especially in. Places with a really bad soil, so there's some. There's some pragmatic, there's some aspirational things depending on the the kind of where the developer is coming from, but lots of possibilities would feel like and I'll just add Mark to that. The lightness of the structure in our experience off the weight of a. Size concrete building it everywhere foundations to lateral system and just you know the savings do start to trickle out of the system savings even though the material itself might be at this point in time across premium, it does trickle down elsewhere to have structure you can pull out because of the the different building weight. And that the only the other thing that I'm kind of I see developing is more suppliers and more suppliers expanding the way in which they they. They're able to manufacture, and I I feel like you have your finger on the pulse of that Matt. I mean, what are you seeing in this in North America? In North America, there's still a ton of capacity. Manufacturer come across Simon number panels, but then you know lumber in general. There is a question in the chat. Try and get you right. You know vulnerability and supply chains and material cost is which part of elements like more than half the cost of a CLT panel of about half the cost of a CLT panel is the material cost. So as it fluctuates you know
to 400%
like it has in the last six months.
Yeah, that's something concerned with.
And so then you start to see shifting to European suppliers that do.
Have you know a little bit more dying and more repetitive process so it there is a little bit of up and down.
I think the long term view is though I marked your question is that bought a supply available a lot of capacity to supply these projects in North America.
And as these projects continue to be built a little bit smarter about wait to put them together.
And the best way to specify projects so that they can be bid by all of those from furs and.
Two ultimately, the solution for your project, that project and I think to add to that on the question of the vulnerability is you're still putting like you take a modular or a metal stud framing project.
I mean, they're still using the same components, so you're still vulnerable to some of that.
I think what we're seeing in the market these days is a little bit of unpredictability of of supply chain, not necessarily consistency of missing or.
Not available materials like you know.
A few months ago is dealing with not being able to get metal deck.
Now I'm dealing with they can't get polyiso insulation right?
So it seems to be changing what's not available every month or something new,
right? So in my mind.
One of the things that all of these things addresses labor issues,
and that's been an issue,
and at least in Southern California,
for for for years is even back to 2008 2009
the market crashed.
A lot of people left the industry,
and even though we've been booming a lot of workers haven't come back to the industry, so there's been a shortage of Labor, so this is actually an plus. The rising cost of Labor so addresses that. To to address the material cost. I think there's an advantage to being an early, and because that's what we're trying to do on every construction project. Get materials quickly as possible, even if you've got a storm on site, which is, you know, not something you want to do 'cause you're double handling your your planning for storage space, etc. But you know we want just in time deliveries button now and given the market we're trying to get materials as early as possible. So when you're looking at, you know, like for a modular perspective where you're building all those units. Innofactor you're getting. All of your materials up front all at once early on the project, and so it's somewhat, you know, that strategy we're doing with in the field, where get all the materials on site as quickly as possible, so. I I guess I it's. It's hard to answer that question because there's some. There's some volatility in in the market right now, but I feel like that that is going to somewhat remedy that. I I don't think it's going to completely solve the problem because there's a little bit of too much uncertainty out there, but I I think it'll it'll help, and I think at least from my perspective, you know it's the best. It's the best commercial for having legit pre construction services.
Meaning the project I feel like for for anything, especially at one of these alternative methods, you really have to have those. I mean I try to get clients to get have pre construction as a matter of course 'cause I think it's good practice, but I'd say it's maybe even more important in the when you're looking at a an alternative construction technology and then you know what I've got on the screen.

Here is an interesting project that's a that's a going forward. I mean it's in design development right now in Northern California. It's a mass. Timber podium with and this talks to flexibility with either wood, modular or stick. Built wood on top, depending right depending on what. Depending on pricing we think that by mid DD will have to pull the trigger one way or the other. I'm not not we but the client, but as a way to this is a client that's very interested in mass timber, but. Didn't want to do a whole building so this is really just swapping out the concrete podium for mass timber podium. There's plenty of technical issues involved in that STC ratings.

Things like that, then structural lateral, but it seems for the for the developer at least a very good way to get you know, to sort of dip their toe into into mass timber and preserves some flexibility. It's it's very similar to you know, a typical podium, just kind of swapping out pieces and parts. Except for this, you know automated parking tower, but that's a different web and R that's rosy. That's next month I think I'm just kidding, but basically that is in this. I kind of put in there as a sort of
hybrid project where you know it is speaks to the
nimbleness of trying to take advantage of aspects of some
of these technologies may be in in a very expedient
way,
not in all in which I think has some
application.
Marketplace and then kind of coming on to #4 in
our innovative or alt construction types is really structural,
precast and really that this is a project on the
campus of Stanford and and this is really Matt.
It's sort of all you.
But why don't you give us a little oversight here
in introduction?
Yeah,
one point to make before we even ventured the
project is just what we're talking about now is structural
precast combined architectural,
skin and structure combined. So there's all of course familiarity.
I hope with frickin that is adhered to a building skeleton.
In this case, we're talking about building where the entire
ting is precast.
So floors attached to walls,
which is simultaneously the architectural exterior.
Using what have you and this truck?
This computer village graduate residences at Stanford is a group
of buildings.
11:50 storeys high, all made out of precast concrete and
it's a moment frame system with 60 foot spanning TT's
on the interior that.
That the residences are built on.
The next goes. These panels fire suddenly all at once,
but if you've done it on it's it's one bayonets,
one story high. And it's the unit itself.
How do you see the glazing pre-installed lifted into place,
as is? The exterior is made for mark fitted for
mark special forms and and that's that's really what goes
into these.
This is our concrete moment frame,
reinforced saying there's. And couplers grab all these units, ticket each other, and really all these systems as one.

And then the next show,

I think the construction site,

and I think maybe one of the bests here is really a benefit you see with a lot of prefabrication and Dave are mentioned this about reductive onset and supervision.

quiet. This site is it's basically cranes and and as these panels go up,

not only do they replace standard safety barrier,

you see right now there's temporary for for tie off,

but once all these in the exterior.

Is up then business as usual can find,

so there's a component of safety involved with the past.

There's a reduction in site presence on traffic that affects the surrounding neighborhood and the surrounding cities,

and the workers themselves, when everything.

At last, noise. This is an active campus and you're really this very benefits of reduction of disruption and trucks coming in is really something that is a priority or university like Stanford. Uhm, there's not.

I'll mention you got a lot of pros going out and maybe the next slide Mark and the pros are that this is a great project and reprocess,

and this is not the only location this is being used.

There's other universities employing this, for example that were involved in.

However, there's not a lot of precast outfits that perform level that knows them that can make you produce this entire on it.

And becomes the Archi structure at one time.

So just maybe point out that there's a little bit of limited when it comes to precast concrete for full buildings dead that we talked to,

you know, we talked about pros,

but there are a few cons too,

right? I mean, one of the things on this is your it's in concrete,
right? Your interior walls are casting concrete, literally your ability to move later is limited. I think you're similar with a modular perspective. You know you're somewhat set in your build for future, so you know, I think that's some of the decision making that has to go in up front is which system do you use? What's your long term vision of your property? Do you want flexibility for future? You know, if you want flexibility for future, maybe you don't go to a precast building. Or if you do precast building you do. Maybe the floors and exterior but leave the interior walls to be filled built. You know there's some different things that you you know. Decisions to be made so there it's not all perfect rosy for every one of these situations everyone every job has its own unique criteria and an outcome and and future use for the building. And so I think you gotta take all that into account when you're making the decision on which one of these to go to. That's very true I, I think about the steel stud panels, penalized projects. I mean everyone is used to seeing steel studs in mid and high rises that are not structural. But it's like no, you can't cut a hole in that wall if it's load bearing. I mean it, that's the system. That's the structural system. So it it is. Yeah, there may be some future flexibility you're trading for sheriff sheer panels and those metal studs to write. You can't cut into this year. Not just one last slide is your from ways to do this arrangement. This idea of building prefabricated housing on those double
Those 60 foot double correcting everything at once.

It was not used for Stanford, however it is being used for other projects where.

You've combined in in some ways my land and pre precast component precasting or component fabrication.

Where you know this comes out on a truck and it's the rigging is already installed,

it's incorporated into the precast double tee that will part of a final.

You've already got the plow chassis to support this prefabricated housing music.

That's it gets into place as it was for Stanford, dropped into place but built top of this.

All the building on top and down in the factory.

And I, I think it it that again speaks to,

I think a current or a theme in all of these, which is you can't. You can't have the what without the Hal,

you know you, you can't design in a vacuum and then figure out what system is the best.

It really starts at the beginning, evaluating because you wouldn't want to go.

You can't leave it very open, you know. But on the other hand,

you can't. With traditional construction either.

You choose a construction type of podium, a 3A podium. That's the world.

You're living in and you live with those rules the same as these.

It's really, I think, as some of these systems are developing.

You know, I think the biggest question that developers in particular asking themselves is when is it appropriate to choose one or the other right?

And so I think that's when you kind of need.

You need the right advisors on that.
So we I think we're Rosie.

I think we're kind of at leaving time for questions, so do you wanna come help facilitate those a little bit short?

So one question in the Q&A was. Do you see any workforce development opportunities coming out of these processes?

If I understand the question, I think you're talking about labor workforce like Union.

I'd say at least in California, as it relates to workforce agreements, when it when it comes to the low income housing, they're typically required, not necessarily a workforce agreement, but at least prevailing wage is required.

I think that's I don't. I don't see it being a a a non or an issue that where you're not going to have workforce agreements.

If that's the question. I'm not sure I fully understand the question, but there is a shift a little bit to having the question, left field labor and more shop labor.

But there is steel field labor so when I look at a project that we're working on that the $55 million project you're probably talking, you know 15 to 20 million of that 55. Is is built in in modular and the rest of it still on site.

So you're still talking, you know, 5060 plus percent are probably 70% more are still on site, so I think there's still some work to tapping into that, and that really is your your underground, your foundations, your podium, exterior skin, the the MVP's that are running in for your distribution, those kind of things are still done on site, so those those, if I answered the question,
I hope I had. But no, that still would be under any kind of workforce agreement if there is.

Well, you know that that I guess makes me think a little bit about.

I mean what affordable housing has driven a lot, especially in the modular world? Because of the way the the various wage requirements and so a lot of the some innovation has come out of the the the labor cost directly right?

And but at the same time it's it's a a little bit like it's influencing non affordable housing without prevailing wage.

Requirements, and that's something I mean, Dave and I are working right now on a project in Hollywood.

That's market rate housing. It's modular and it's still making sense regardless of the the wage scenario.

So and and I think that that's a.

That's where I see at least the future going where there's an incubator for some of these technologies.

Once the system is learned, they start to be competitive in a in a in a market rate environment.

Thanks so another question was, will Katerra come back from their bankruptcy?

You know, I, uh, I would be surprised if they do, and I think that you know, and we, I mean, many of us have kind of.

At least approached or been approached by Katera and you know at least my opinion.

My frank opinion is that they were trying to do everything all at once.

You know, at such a high integrated level when really what what most of us are living with is actually a very diverse and complicated commercial real estate environment,

and so rolling it all together is a great vision.
But it seems it just seems like so high.
A bar to achieve so I feel like the what
they were trying to do is happening in little pieces
in other areas.
And you know, I know there's there's additional investment
and
and a new I guess versions of of approaches to
that,
but I think it I think it'll take time and
I don't think there's going to be one.
Or I hope not. 'cause I'll be out of a
job I,
I'm that there's going to be 1.
Kind of entity that can kind of do the whole
process.
It's really, it's hard because it's ever changing.
I mean I don't know what do
you
think Dave? Well, I I think I mean not answering
Nestle directly.
The question about Katerra, but you know I'm in the
job of risk mitigation.
and so you know, one of the things that we're
looking at is you're you're.
You're you're putting all your eggs in for I'll go
with the modular example,
you're putting your eggs in the basket,
you're, you're committing to a manufacturer early on.
Uhm, and so one of the things that we're doing
is we're bonding getting a bond for the entire scope
of work.
Now everybody knows a bond is isn't the greatest thing
because you gotta collect on it,
right? But you know another thing we're doing is we're
asking these suppliers to provide a letter of credit,
and so some of the letter credit is,
you know, we're we're moving forward with our spending
$150,000
on a design phase.
Or what happens if that design?
You know they don't move into fabrication.

Well, I got a letter of credit for $150,000 that I can go get my money back now that doesn't help the project move forward.

We got, you know, but at least we're mitigating that risk and so that's something that I think most of the manufacturers are open to doing because, you know, like I I said before,

I don't think any of this technology is new. I think Matt made the comment new technology for mass timber 30 years ago,

right? So I mean, in the construction world.

I think we move slow,

right? So 30 years is new.

But none of this is new,

it's just maybe new to you and and so some of these suppliers out there.

They're used to this. They're there,

they know that that there is a little concern,

and they're willing to, you know,

put up put their money where their mouth is,

and and give you a bond and give you a letter of credit to you.

Know that show you know that good faith that they're going to be moving forward the project.

Rap maybe by saying, you know,

if not catero coming back from the dead,

you know there's plenty of intellectual property and a lot of brain power that was there that has been distributed throughout the industry.

And like Mark, it's gonna happen on smaller scale once, not in a single entity,

but well throughout. And so I think we will continue to see innovation and.

Uhm, good ideas brought to this.

This part of the evening.

Thanks, Uhm going back to mass timber.

We had a question on how the balconies and cantilevers are achieved with mass timber construction.

Yeah, the innovation of certainly cross laminated timber specifically is
that it is that layered weave of of a dimensional lumber,
so it has strengthened two directions.
So primaries left making your balcony is up down South. I guess then you can adhere a balcony onto that.
Cross submitted timber panel and then and you can as long as you can make the appropriate connection from material
to material that work.
Or you can actually. Mass timber being two directional,
you can cantilever those panels over a column,
so there's no reason you can't extend beyond a one story column and come back and work computer.
I don't know, just forward,
but also to this. Uhm,
so that's really been. The innovation or what?
What cross limited timber as a two directional material has brought to the market is that you can do balconies and you can make it work more like a cast in place or precast concrete structure.
Thank you. So we had a question with the added effort in design and pre construction over on site work.
Is there a workflow synergy with also pushing modular prefab toward higher thermal performance methods like Passivhaus?
Those approaches also typically have a front loaded workflow.
Yeah, I I think UM. So there is more work up front,
right for sure, and there's also different people involved,
so in that respect I think it's it's like any design process that's trying to do something a little bit more.
The interesting thing speaking specifically to passive houses that you know or the criteria is that the it's a lot easier.
To manufacture something you know with with better,
I guess more precision and better results.
And that's really what you need for particularly for the
exterior skin of the building and the insulation, right? ‘cause you can design anything on paper? Will it function that way? And well, if you can prototype it and mass produce it, there’s a much better chance that it’s going to perform as designed, which is that that gap sometimes between the the design and the reality. So I don't know that directly answers the question. Thank you and then the last question. The Q&A was have any of the presenters combine modular prefab projects with other novel project execution approaches like integrated project delivery? If so, how does the risk distribution reward distribution work with factory assembled components? Can you speak to that Dave? I have some thoughts but I would like to hear you. I don't. I don't know that we've really done it. I PD. But I would say it's all of quasi IPD if you will, right? I mean, I think that's kind of. The idea of I think I mentioned earlier is I think the the best method is to get your architect. Your your suppliers, whether it be precast or modular or mass timber, whoever it is and your contractor on board up front. And so regardless of who holds the contract or how it's it's, it's contracted it. I think the it's ultimately is a quasi IPD, right? I mean we all have to work together to to create that design in order for it to be successful. Yeah I I would echo that completely. I think I I've sat in meetings thinking like this you know, or or wow this is.
Design assist or sometimes literally design build and so I think that I think that but what? What I haven’t seen though kind of like David saying, is literally under that rubric or whatever. Where there's a uh where the risk and rewards are specifically called out, and I don't know I, I know that there's always you know. I mean, there's most construction contracts have penalties in them, right? But usually the reward is not getting a penalty. I don't know. Sorry, we have one more question in the chat. And that is sorry, give me one second. Have you seen any issues with obtaining insurance for GC's doing large modular project? Being that mod? Insurance can go. Out of business, sorry. I think there was a spelling error. Product timely delivery, suffered damage, fires, etc. Does that make sense? Sorry, let me just start over. Have you seen any issues with obtaining insurance criticise doing large modular project? Being that they can go into business or their suffer damage, fires, etc. I believe that's the. Question I don't think I've seen anybody having problems getting insurance. You know we. Yeah, I don't. I haven't seen anybody having problems getting insurance. You know, I think that the the I think your issue of going out of business I think is what I was ultimately talking about with getting a bond and one of the things that I had spoke with a bonding company. Was their thoughts, at least at least this one bonding company over one modular manufacturer? Was they their preference? Would be to help.
That modular company limp through a project and get it built. If that were if they were to be, you know, on the edge of going out of business because it in their mind it would be cheaper to finish the project and it would be to try to get someone else new because you get someone else knew you're you're essentially starting over.

So for at least from, uh, you know I, I'm not a insurance company or a bonding company and know how they think, but that's that's what I was told is that if it were to get to that point that they would rather. They would rather finish the job than try to start over. Yeah, from what I've seen in various projects, the insurance isn't a problem at all. The you know the the funding sources though for projects are have been I think maybe the bigger issue depending on the kind of project you know and and it's degree of public money or not. And and there's definitely been.

I feel like the the the capital has been. Uh, how? How can I say the the slowest to come to the table and but I don't blame them? I mean if I had capital, I would be really reluctant to to to fund new things when I could fund existing things. But and I think that speaks a little bit to hey, we just need to see enough of these projects happen. They work, they're successful, and then then all of a sudden it's not a alternate technology.

It's just another technology. It's just another construction type and. I feel like that's very much where we're on the edge closer than with some than others. But where we are with a lot of these column innovative construction types, I think they're
getting the the. The lending industry is getting more understanding

right? 'cause they're used to.

We don't pay until we see it on site where

gotta flip a little bit where you're paying before

it's actually installed on site.

That's I think that's the difference in.

So actually

it was a question in the Q&A our lenders comfortable

with funding projects with these technologies.

Someone else also asked, you know,

are you having issues getting insurance for mass timber,

modular or not?

Yeah, I would say insurance hasn't been an issue,

at least on with my clients and the projects that

we're working on really haven't seen that as a as

an issue.

And I know I, I know we're a little bit

short or maybe even out of time,

but I wanted to just throw one thing out there.

For David Matt, you to answer,

which is what do you see happening next?

I'll answer really quick. You know what I see happening

next is prefabrication through 3D printing.

I'm seeing that start to become a thing.

You know? What do you guys seem?

I'd say in general I see a lot more in

the market of asking questions.

You know this question that we're trying to answer today.

When can I do it?

What should I do? Who can I talk to?

Write it? There's a lot more interest in alternative methods,

and there was before, and it seems to be mostly

driving.

How quickly can, at least in the Southern California market,

how quickly can I get it to market?

You know, what can I do?

That's going to bring it to market faster?

For what's next? We see a real focus on sustainability

with developers is you know,
how does this affect. Uhm?
My project and how will it be perceived by the end users?
I think people are clamoring understanding that highly sustainable projects are important and your materials aside, there's a lot of. Savings and streamlining that's done with off-site fabrication that can relate to sustainability, even concrete. You know, there's you can heat the form work and reduce a lot of the cement and so in. That way you're pulling carbon out of out of the process,
so I think there's a lot of those to argon. Through any of these, you know.
Steel component panels. Master of course, highly sustained income. All of these are going to start integrating because everybody is going to start asking for it and I really think that having an accounting of all the material in your project is going to be critical because everybody cares about it. The developer, the end user. I care about it as designers, you know. Positively affecting the built environment, so I see is next.
Sorry there was one more question that just came in about whether you're seeing anything being constructed with shipping containers.
Any final thoughts on that? Yeah, I can speak to that.
We had looked at that for a project and I do see I do see that the issues are mostly scale, so if you look around at least LA, that's the city. I know the most. You're close to a port so that works. You have local manufacturers, but typically they can't do buildings that are.
You know, their sweet spot is maybe. 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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