**STORY:**

Welcome back to your Project Shepherd Construction Podcast. Our last episode ended with Brian and Heather signing a contract that Derek, their builder, found online, and they finally got approved for their construction loan. Despite some pushback from Rick, the architect, Heather still thinks they've made the right choice by hiring Derek, and in the first month after closing on the loan, Derek has made great progress.

Apparently, he's gotten the foundation poured in the framing. Lumber is being delivered this week and everyone's starting to feel good. But opening her email one evening, Heather finds they've received Derek's first invoice. She thinks to herself that it seems a little early -they're only about to start framing. When Brian comes home from work that night. She spins around the laptop and shows them Derek's invoice.

"I cannot believe this, Brian says. Is he seriously trying to charges for his insurance and gas? This is not what we agreed on."

"Well, what did we actually agree on?" Heather asked, "I told you what Rick said about that contract." Look, Brian said, "I'm sure Eric still just annoyed he's not getting kickbacks from us using one of his builders. Don't worry. I'll have a good talk with Derek."

The next morning, Heather and Brian crowd around his phone as they call Derek on the speaker.

"How are my favorite clients doing?" Derek asks

"Good morning, Derek," Brian says, "We need to discuss this invoice- we never talked about paying for your overhead costs."

"Well, what do you mean, overhead costs? Those are the costs of building this house. The insurance is required by the bank, and I use that gas driving to your job site."

Brian takes a deep breath and says, "Yeah, but that's about 10% on the cost plus is for. You're making a lot of money in markup on this job and we are not paying separately for your gas and insurance. At this point, I'm surprised that you didn't ask to be reimbursed for your lunches, too." Brian says, "Derek, that was a joke, but we are not paying for your insurance, gas mileage or anything else. Those are your costs of doing business."

Derek says, "Honestly, I've been doing some math and I'm starting to get worried. I think that 10% is not going to be enough to pay my bills or my family's expenses."

Brian says, "Look, we signed the contract and we have to stick to it. Are we on the same page? Yeah."

"Yeah," Derek concedes. Once things really get started, I guess it won't or shouldn't be an issue anymore. Honestly, there have been a lot of hurdles to get to this point. But Derek is feeling good about having his first custom home underway and he's sure that cash flow is going to improve as things finally start to move.

The next week, framing materials get delivered and Derek meets the framer on site as they're looking over the plans. The framer calls Derek over to confirm some details. The framer points out that the engineer's plans "show number two lumber for the walls, but it looks like all this lumber that you ordered is number three. I've only seen that grade used for walls and track homes. What's going on?"

Well, the truth is that Derek already made the executive decision to save money on the budget and go with the lower grade lumber. He told Brian and Heather that he was going to look for ways to keep the costs under control. It shouldn't be a big deal. And he remembers hearing his former boss boil off some more concerns.

He's got this.

A few weeks later, Rick is driving the neighborhood and sees what appears to be great progress on the job site. He decides to pop in for a visit, hoping to maybe catch Derek and finally meet him. Walking in, he notices a conversation taking place between a young man and an older man who appears to be a framer. The two are comparing the architectural and engineering plans. That must be Derek, Rick thinks to himself. But instead of introducing himself, he decides to go on a self-guided tour.

Immediately he notices the walls look a little off, and he notices a number three grade stamp on the studs. He can't believe Heather signed off on this after all that talk of a high-end custom home. I mean, number three is way different than number two. Number two is more expensive for a good reason - It's stronger and typically straighter. Number three is generally used in much cheaper homes, and it's used in like nonstructural applications, like blocking, embracing if it is used in a wall. Later in the process, builders will use a heavy orange peel drywall texture to help cover the imperfections. Essentially, this is going to prevent Heather's plans for the smooth wall she talked so much about.

Rick leaves the site as quiet as he arrived. Once in his car, he called Heather and got her voicemail. "Hey, Heather. Rick here. I just swung by your site as I promised, and there are a few things I think you should know.

Give me a call back."

Riding in their car. Heather silenced the ringing phone as they pulled up to the side of their new home. Derek texted them earlier about the great progress being made, and they couldn't wait to see with their own eyes. It was obvious from the outside of the framing it had started in. Brian and Heather are already starting to feel a sense of relief.

However, as they walked into the new home, Heather stopped, walked up and stared menacingly at a big beam, dropping below the ceiling and their future living room. "What is that?" She asked, trying to reduce his wife's stress. Brian called Derek, who was driving home after a long day on the job, "Yeah. I thought that was a fun thing that you had, the engineer adds," Derek said.

"We didn't have the engineer add anything, we want to stick to these plans," Brian said. "If there's differences, we need to know.

"Y'all were sent the engineers plans, I mean, you're the one that forwarded them to me, how am I supposed to know the wrong Plus? That seems cool. I just leave it. Wrap it in decorative wood." After several hours, a phone tag between Rick and Derek and Brian, they finally got some answers.

No, it wasn't on the plans that Rick made for them, however, the engineer added it to account for structural support needs. Brian and Heather didn't know there was any difference between the two plans because they didn't need a check and now, they're wondering what else has been done without their approval. Derek argued that his job is to follow the plans, and that's what he did. Even if he were able to ease the cost of removing the beam, he shouldn't have to. They made it clear they're on a cost-plus payment model. For once, Derek feels that's working in his favor. The options are to leave it, which Derek has in favor of to save time, money and energy, or Brian and Heather can spend 3000 more dollars to have it moved, which they can't really afford at this point either.

Ultimately, Heather tells Brian that she can live with the beam if it means not having to spend thousands more dollars. So they take Derek suggestion to wrap the beam in a decorative manner and make it a feature in their new home. While construction has just begun on this home. It's becoming apparent that Derek's lack of experience is causing problems in all this back and forth about the beam.

Rick mentioned that there may be some other missteps that have occurred. Heather feels too overwhelmed to get into those right now. According to Rick, Derek is skirting the specs to save money, but that's likely going to cost Brian and Heather further down the road. When the framer pointed out discrepancies in the plans, Derek made the decision to go with the cheaper options rather than communicate with the engineer Rick, Brian or Heather.

While Brian and Heather happy their home builder is moving forward, they're annoyed their custom home is already looking much different than the plans. Brian continues to assure Heather that it's all going to work out. After all, this is where they're going to welcome their next child and raise their family. It has to work out. But will everything work out?

Make sure to tune in next time to learn more about the missteps that Rick has warned Brian and Heather about.

**INTEVIEW:**

Curtis Lawson: Hey everyone. Thanks for joining us for another edition of The Your Project Shepherd Construction Podcast. I am your host Curtis Lawson and today, we are going to dive into the world of engineering and how that relates to the custom home process. Sitting here to my left, I have got my friend and a very essential business partner, Karl Breckon, with BC Engineers and Consultants – Hey Karl

**KARL:** Hey, how are you doing?

**CURTIS:** Great, thanks for joining us today. We have been working together for a long time now and it is always a pleasure to collaborate with you on projects. You guys put out great work, you listen to us, you help solve problems, and you are always super responsive when things come up and I really appreciate that.

**KARL:** Thank you, appreciate it.

**CURTIS:** As I was prepping for today's show, I went to your website. I always get on my guest’s website - even if I have seen it before and have been working with you for a long time - I always like to go to the website and look and see what you have on there. On the homepage of your website and in the middle of the picture, it says “Whatever it takes” Karl Breckon, the quote. So, tell me about that and how that relates to your business.

**KARL:** Very well. I believe that what we do, as a business, is whatever it takes. I mean, whatever it takes, whatever it takes to get the project done. Whatever it takes to satisfy our customers, just to make sure we are satisfying things, so that's our kind of our motto of the company.

**CURTIS:** That's what I love to hear. That is why we that's why we like working with you guys and we send all of our customers to you guys too. So, Karl, our friends Brian and Heather that we just heard the story about. They have had a pretty rough go of things…

**KARL:** They certainly have

**CURTIS:** way back toward the beginning of that story their home designer had completed his designs, he got him a couple of proposals from Engineers - one was a firm who (in his words) kind of over-designs everything and the builders say he drives up their costs; that guy was around $6,000 bucks for the engineering on this property. The other proposal is from a company that he said mostly does work for a production home, and spec builders and his proposal were only like $2000. Of course, being the prudent shoppers that they are, they went with the cheaper option because you know, it is just engineering. What could go wrong, right?

So, tell, Me, what is the difference between a cheap engineer, so to speak, or maybe somebody who just stamps plans for spec homes and a company like BEC, that does structural design and civil design for Custom Homes?

**KARL:** Well, it is two different ballparks or two different Arenas that you are playing, in production homes, everything is basically the same. Yes, there are different elevations and things like that, but basically, the homes are pretty much alike. When you get into the custom side, particularly in this case, where the home was in a floodplain; that is a significant difference. You got to really know what you are doing because it is a different foundation design, it is a different design of how you are going to support the home. How high is it going to be off the ground? Does that include civil drawings for that price that they are talking about, in doing that, when you are picking an engineer, you got to make sure of the following: have they done this before? Do they know what they are talking about, do they know the regulations for floodplains? In this example, it would be that they are talking about, with Brian and Heather, and to make sure that is going to satisfy the city when you take those for a permit. It doesn't do any good to go in and have these plans that are done by a production engineering type and didn't know that is supposed to be raised to a foot above the 500/year designated flood elevation or did not know what the design was, did not know how to mitigate, did not know the conveyance analysis, you know, there's a lot of details that go into that.

**CURTIS:** Hmm. So, the next problem for them that came up was, you know, the material prices have gone up and we know something about material prices escalating. We have been dealing with that for the last 12 months or so here. The Builder knows they are on a budget and so he thinks he's helping him out, I guess. It is a cost-plus contract, so he is helping them out - he's subbing some materials to save money. Maybe he used a different type of studs, maybe he's thermos ply sheathing instead of an OSB sheathing, but what is the problem here, he is just trying to help him out and save them money. What is the problem with him just making some substitutions on the fly?

**KARL:** Has the substitution been checked from an engineering perspective? Does a 2 by 12, is equal to an engineered beam? You do not know. What is the span? You talk about these some of these homes, especially the custom homes that have big great rooms and kitchens that are joined together, so it is all one big room. Those have different engineering things that you need to consider if it is going to support the loads, particularly in a two-story house with the loads above, does that substitution really work? You do not know until you do you run the numbers and see.

**CURTIS:** Right and so swapping things like, you know, sheathing on the outside of a house, you know, going from a three-quarter inch sheathing to a half-inch sheathing or going from a half inch to using a thermal ply sheathing. I mean that stuff can even have big implications, right?

**KARL:** Oh yes, definitely. So, there is a sheathing that is what we use for sheer walls - if some of your listeners do not know what that means - but the sheer wall holds the house up if there is a windstorm, and here in Houston, we are in a windstorm area. So, you got to be careful about what the sheathing is on and if it is done, right and it is nailed to the studs correctly.

**CURTIS:** Right, that could be a code issue as well, right? And so hopefully, the city inspectors going to catch that

**KARL:** Doubtful.

**CURTIS:** So, you know, if the Builder does not care, you know, maybe the city's going to catch some of that but what should a kind of prudent homeowner do after the framing goes up? Do you guys offer some services that they should take advantage of after framing?

**KARL:** Oh, definitely. So, when the homeowner is doing, they are doing their build, we are there as their “insurance policy.” We go in and make sure that the framing is installed per plans. If it is not installed, per plans, we write it down and we write a letter and say this needs to be changed. Recently, because of all the material changes, the material costs going up, we had letters that are two pages long with all the deficiencies that we caught during the framing stage. Some of these things you just got to really pay attention to because some of these things are acceptable and some are not. The builders do not like it because it will make them change things out, but, you know, it's got to be right - it is here for the long term. What I always tell my people is, “We are building people's dreams. We are designing the dreams” and the builders of course are building their dream. You do not want that dream to become a nightmare.

**CURTIS:** Right, so other than that framing inspection, which is super important, what other inspections do you guys offer? What phases do you recommend that people get an engineer involved in?

**KARL:** Well, the engineer should be involved from the beginning with the design team. What are they building and what is their goal? Let's look at some different things: we can work with the Architects and the builders, and we like to have a teamwork atmosphere because that's the team that's going to be building somebody's dream. We want to make sure that that is right as far as the other inspections, it starts from the beginning before you pour your foundation, we should go out there and look, and make sure that the reinforcing is installed as per plan. That is their right, and the beams are all there, the reinforcing is all there, the beams are deep enough and there are things there such as if they want shower drops for example. There are lots of details that go into that, so the makeup has to be right.

**CURTIS:** Yeah, you know I joke about the city inspectors, you know, maybe they would catch mistakes or substitutions, maybe not. But, you know, there is some truth there, right? I mean, the city inspectors there, they are probably overworked, you know, at least here in Houston, they have had a record number of plans in the city, houses being built and so those inspectors, there's not that many of them. They are overworked, probably underpaid, or maybe not always the best-trained inspector. I am not knocking the city of Houston guys, there are a lot of great people there, but you know, honestly, there are some people there that are kind of green. You know, in my experience, those inspectors have specific things that they look for - their pet peeves that they watch out for - on a project, and so I think might always pick on one thing, but sometimes overlook other things. Yeah, I mean, I have had framing inspections where one inspector will come out and catch one thing. Another inspector will come out and catch something else, ignore something else, and a third inspector will come out and not care about the other two things, but he has something new, right? So, you know, having the engineer do inspections and even the architect, having that second and third set of eyes can make a real difference.

**KARL:** Oh yes, definitely.

**CURTIS:** Catching these problems.

**KARL:** Definitely because I mean like you said these city inspectors, they are overworked. There are a lot of houses going up, there's a lot of building going on right now, and sometimes if they see and they ask if there is an engineer there, they will just do a drive-by because if they are no good, they know they are going to get a letter because at the end of the day we are liable for that structure. We want to make sure it is right because it is our liability, but it is also our reputation that is on the line.

**CURTIS:** Right, and those inspections that you provide, and also that the architects provide, you know I think some Builders might you know, kind of cringe at that they see those as being adversarial even they are like, “oh man I got to do it engineering inspection or that architect is doing a CA and I got to deal with these guys coming out and poke around my job site”, but you know those inspections do not have to be adversarial, they should not be adversarial.

**KARL:** They should not be. As I said, we are a team: the architect, the engineer, the Builder – we are all a team. We are here to get the job done, or the most cost-effective, and as quickly as possible.

**CURTIS:** Yeah, I mean, the end goal is to give the customer the best product. As you said, we are building what their dream is and even good architects, good Engineers, and good builders - we all make mistakes we are all human.

**KARL:** We are all Human

**CURTIS:** You know, I do not think I have ever seen a perfect set of drawings from anybody. There is always some - even if it is not a major mistake - it is something that, you know, hey, this does not quite line up, there is a question. Having that extra set of eyes and being able to pick the phone up, call you, and say, hey, I have got this issue that we found what's let's meet on-site and talk about it, right?

**KARL:** Most of the time when we find issues that have happened on the field is because, for example, the architectural drawings have changed, or the homeowner comes out, the client comes out, they look at and they say “Curtis, I would rather, I want this bedroom wall to move over two feet.” Well, does the choice work? Is that take the loads? Where does that go? So, we try to work with you and get through those issues, but it's hard for people to envision going from a 2D plan to a 3D.

**CURTIS:** Oh, yeah, yeah. So, you know, I love the phrase, ‘trust, but verify, right.” That is one of my favorite phrases in this business. Yeah, you think you hired a great builder or great architect or whatever, you know, trust, but verify and make sure it's done the right way.

Do not just take the guy's word for it, you know.

**KARL:** As you know, you are only good as your worst subcontractor, right?

**CURTIS:** Right. So, you know, the architect, the Builder, the engineer, the building performance guy, like, if somebody like Toner is involved, they all really need to be on the same page, from the very beginning of the project, during design, to make sure that the right products are specified that those products work together because certain products just should not be used in combination, right?

**KARL:** That's right. You know the other thing is when you work with the architect and builder and say okay, “if we just move this wall over 6 inches, now we get the first and second floor walls, line it up”, and that makes a big difference in a cost-effective design. If not have the loads away from the walls because you want those loads to come all the way down to the foundation.

**CURTIS:** So if you are engaged at the very beginning of the project, you know, we do this all the time, when we are designing a house whether we are doing it in-house or with an architect, one of the first things we talk about is, how are we going to route our mechanical systems? You know, our end goal is to have these open spans and so all those conversations are going to involve you guys to make sure that, you know, kind of what is in our head and what is on paper can be built and we do not get in the field, all of a sudden, hey, there is this beam and the way…

**KARL:** “There is this beam in the way” -I wish I had a nickel for every time I heard that!

**CURTIS:** Trying to run my AC but this beam is right in the middle where the duck has to go.

**KARL:** We think about that during the design stage too and we will talk to the architect and say, “What if we move this, what if we just move this column over to here so you can get your AC through and we can run it over this wall, instead of trying to route it around the whole building.”

**CURTIS:** Yeah. So, I think people think of the engineer as getting the plans, kind of after the architect has finished doing his work and a lot of people do that. That is a problem and that is probably how you get most of your plans - after they are done and then you are kind of coming in and playing clean-up and making decisions on how to change something that has already been designed maybe.

**KARL:** Well, that is where we talk to the architect and go through it. If we see something in there, that does not make sense, “Hey Mr. Architect let's talk about this, let's go through these, let's go through these plans and come up with a design that can work and will be much easier to build.”

**CURTIS:** I have also seen situations where people maybe balk at spending a little more money on something - engineering-wise - hey, you know, I do not really want to have that steel framing or I do not want to pay for that big beam to get put in, let’s you know, what's changed this, but then they start living in the house. They are like, man, I really wish I had done that, you know, you know, so spending, maybe a little bit more on some engineered products or engineering design, or whatever, it might hurt for $5000 or $10,000 when you are building a custom home, which in the grand scheme of things isn't that much in a custom home. At the end of the day, they are going to be happier when they were living in it because they are going to see what they really envisioned.

**KARL:** Right again, you are building their dream. So, those things need to be talked about. So, yes. Okay. You have this 35-foot span here that you want, well, that is going to be steel, you know, but if we just did this and this, we might be able to take that steel on just using an engineered beam. You have to make that decision because now it is not as open as it was before - now if you want to put a steel beam, no problem.

**CURTIS:** Yeah, we have been through that recently and if it was you or Reese, but, you know, we had one where they had a ton of steel and we are like, we got to get the steel budget down, but that is going to mean having a column here. So, we went to the client, and they were like, hey, mister homeowner, are you okay with having a column here on your patio, instead of this beautiful big, cantilevered balcony? At the end of the day, you know, they said, yes, I am okay with a column because it's going to save me, $30,000, and those are the decisions that you need to talk about.

**KARL:** That is what we are here for, is to help them make that decision. Now some people say, no, I do not want that column in there, do not put it in a steel beam.

**CURTIS:** Okay. Well, you got to pay for it, right? There is no free lunch. So back to Brian and Heathe – we have seen them make some pretty big mistakes in this process but tell me, you know, what are some common, recurring mistakes that you see, or that you've seen over the years you've seen homeowners make, or even builders.

**KARL:** Including me sure.

**CURTIS:** Yeah me too - I could write a book about this.

**KARL:** Definitely. So, I think, what people are going, especially with the custom home, as we are going to go say, do not necessarily want the most the cheapest person that's out there because there's going to be additional costs going on down the road that you did not foresee. So, if you want somebody with experience in a custom home, get the design team and the builder involved from day one, and go through these plans. That is what you want - make sure that is what you really want. So that is one of the mistakes and then also saying, okay, I want a five-bedroom home - well, when do you get the construction cost of what it is going to cost to do that, well, that is not in the budget. So, start out with this is the budget and then it was people like you and me and the architect, we can sit down with them and say, okay, this is what that is going to buy you, in the budget.

**CURTIS:** Right, designed to the budget. I think people get that order wrong; they are going to design this home, like Brian and Heather did their story, you know, they got their plans on the internet then they sent them to Rick, the designer, and he designs this amazing home that is five bedrooms, a game room, a media room and all of a sudden, it is at 5,000 square feet and they are like what?

**KARL:** That's the thing - getting plans off the internet, I am not a fan of that at all. We see those things and that is not designed for Houston. Houston is a totally different design from what those plans you are going to see on the internet are because it is not designed for this area. No two areas are alike, and Houston is definitely different because there are soils, and what happened with our soils with the clay soils here, foundations move a lot. That is a totally different design than you are going to have up in Colorado…

**CURTIS:** …Colorado

**KARL:** Florida or any place like that.

**CURTIS:** So aside from the mistakes that you see people make, what are some red flags that customers should watch out for when they are going into this process and they are interviewing a builder or even an architect, what are some red flags that people should want should watch out for?

**KARL:** Okay, I say the first one you are going to be interviewing is probably the architect first because that is who is going to design the home at the end of the day. Have they done this before? Have they done similar homes before or are they just doing production homes, were they just doing townhomes? This is all fine, it has its place. Have they done custom homes before or homes like you are wanting? You have to have a good relationship with them. Do you get a warm fuzzy feeling when you are talking to the architect? Do you like them?

**CURTIS:** Are they going to try to push their ideas on you or are they going to listen to you? Of course, there is a different way with various schools of thought on what that means - some people go *TO* an architect because they love that architect’s vision, and they trust with that guy's going to design; some people want the architect to listen to them more and do it how they want. So, there are a couple of good approaches there.

**KARL:** Well you have got to be able to listen to what the customer wants at the end of the day. There are some great architects out there who design really, really nice homes and I do not have the kind of brain to do what they do, but they are very smart people who produce some really interesting designs

**CURTIS:** On another topic, I think that building a house today is way more complex than it was 20 years ago for sure, more than 50 years ago, some of that is Energy code related, some of its, you know, that the houses are being built tighter and then of course from your perspective, some of that is that the land is in short supply and so, we are building houses on locations that are maybe less than optimal. You know, maybe we should not be building houses in a swamp or in a floodplain, that's another discussion. But, you know, and then some of it is just technology - now, we are trying to cram ten pounds of stuff into a five-pound box here. Then at the same time, what compounds the problem is that there is kind of this low barrier to entry to getting into the construction business in Texas. You know, we do not have any licensing regulations for builders, so you can just print a business card or slap a magnet on your truck, and boom, your builder.

**KARL:** (Sarcastic tone) A pick-up truck is all you need.

**CURTIS:** So other parts of the country that people may be listening - they are not as loose as we are here, but anyway, hey how do you see those things such as the complexity of projects of homes, weird site conditions, and then also the soil as low barriers to entry for builders - how do you see all those things affecting the outcome of it than a construction project? I know that are a lot of things there to answer together.

**KARL:** I mean you are right. I mean we are in a shorter supply of land even though Texas is very, very big, people want to live closer to downtown – closer to their jobs because of gas prices these days - so they do not have to drive as far. Those properties, the prime properties are probably already gone. So you are buying a house that maybe you are going to tear down and build, over in Bellaire, West U, and those areas. But a lot of those properties are already gone so it does make it more difficult as you get into these areas and also because of the way the designs are, like you said they are tight - the houses are tighter and the codes are different, materials are different, the rooms are much more open so that that makes a little bit more of a difficult design process. So you know you are trying to be energy efficient on top of all that and a lot of times you go with two-by-six walls on the exteriors and two-by-fours you need the insulation, you need to meet the new insulation codes of the new energy codes that you have to these days. You have to have a part of the roof that is solar-ready.

**CURTIS:** Right, you have to be able to support the weight potentially if the solar panels are to be put up there.

**KARL:** Correct. So that is a Houston code. So, the codes have gotten much more stringent than they were and the building materials or a lot different than they used to be. And I think the biggest change that I see, is that there are a lot fewer walls, and then people want sloped ceilings or vaulted ceilings - everything is formed by rafters which makes designing those types of homes, are it is a challenge.

**CURTIS:** Yes. And executing them to, you know, we do a lot of forensic consulting and getting involved in projects that went bad, most of the problems that we see are usually a combination of the builder and architect, together, maybe designed and built something they were not quite qualified for, and they did not take all these factors into account that were discussing and that just long-term affects performance and the building science, you know. So, let us just touch on building performance really quickly. What does building performance mean to you as an engineer?

**KARL:** Well, there are a lot of different meanings to that, that is a that's a broad subject. For me, building performance means structurally, it is sound, and it is going to stand up. I always tell people our job is to take the Architect’s drawings and make sure the building stands up and does not fall down. That is what Structural Engineers do so building performance, just means that that it is going to, it is going to work structurally.

**CURTIS:** Yeah. Do you guys get into looking at kind of the moisture planes and drainage planes and things like that as well?

**KARL:** Sometimes not often, but sometimes, yes, from the *civil* standpoint, yes, we will look at that and see where you going to drain away, but as far as the building goes, that is more of a **Toner Home Matters.**

**CURTIS:** Yeah, it matters if the building performance designer and the architecture. So, do you have any stories for us of any projects that, you know, that have just totally gone the wrong way that you've seen or been around and you and your career?

**KARL:** How about my personal house?

**CURTIS:** Sure.

**KARL:** Well, we started at probably. We live out in the country, and we did hire a builder. I designed the foundation and had an architect who was well-known from here in Houston. We got going with the building plans and come out there to watch the concrete get poured and tested. So, I had a testing company there to do the slump test and all your people do not know what that is, but a slump test is when the concrete comes off the truck, you want to have a little cone that they use that you use to take that test and when you pull the cone off, you do not want to do you want to the slump to be about 5 to 6 inches when you are pouring concrete. Well, they pulled the cone off the first one and it was like 10 inches.

**CURTIS:** Wow

**KARL:** So, I went out to the guy that was at the truck on the street and I said “So, you add water to this truck before you pour the concrete.” He responded, “Oh no, sir”. I cannot tell you the exact words that I said at this point, but I did not believe it, we will just say that. So, I rejected two trucks that were sitting out this tree, so they had to go away so naturally, the subcontractor is not happy about that because he paid for concrete that he is not going to be able to pour. So the next truck that comes by, would not even hardly pour down the shoot, it was that stiff.

**CURTIS:** The opposite problem.

**KARL:** Yes, it was the opposite problem. So, and then try to watch these guys pour concrete and try to teach them how to use a concrete vibrator to make sure you get up against the forms of stuff, which was interesting. Finally, we got the framing, and it got us through all that the builder actually hated me because I have come out there on the weekends and taken my orange spray can and said nope, I do not want this stud

**CURTIS:** Mark some studs (laughing)

**KARL:** Mark the studs, nope X. So we finally got through it and actually get ended up firing the builders, so we ended up after the framing stage, my wife and I took it over, and really, we did it ourselves.

**CURTIS:** Really? Ha-ha, can you share with us kind of what he was doing wrong? Wrong kind of what, why did he end up getting off the project?

**KARL:** Because he wants to do it his way - we were wrong and he was right – one of those kinds of guys, right? We decide that we are done, and we caught the plumber stealing stuff from the job site too.

**CURTIS:** So if you had not had that knowledge and if you had not done that slump testing yourself, right, let us just say, this was, you know, Joe homeowner’s house, where that foundation was getting poured, I mean, what are the implications to having that concrete mix being off and, in a way, that is going to perform?

**KARL:** For your listeners to understand, if the concrete is too wet or has too much water in it, that is why you have that kind of slump test performed. What that means is, it is probably going to crack. You are going to get a lot more shrinkage cracks in, it is not going to perform as well over time. It is not as strong as the specifications were, and you will end up with a lot of cracking in it.

**CURTIS:** They say two things are always true about concrete: it is hard, and it cracks. All concrete.

**KARL:** All concrete cracks, but the more water you put in it, the more, those cracks you are going to see.

**CURTIS:** Right, for sure. All right, so I am going to switch gears a little bit here and ask you a couple of questions that I am trying to ask all our guests. It is kind of unrelated to what we have been discussing but I always love hearing these answers. So, tell me in your mind what is your dream customer, what is your dream client? This may be a lot different for you as an engineer than for me as a builder or an architect.

**KARL:** I think it is somebody who is - my dream client is somebody who comes back and talks to us and goes through it and we can talk to and get through the design process, and they are happy at the end of the day. They say, oh these are, these are great plans, that that makes, that makes us happy.

**CURTIS:** On the flip side of that, what is somebody that, you know, is maybe the nightmare client or maybe, who should not go through this process? What kind of person is not suited for going through the custom home-building process?

**KARL:** I have not really met anyone that is not really suited for it although a lot of times we get a lot more questions (which are all good) from other engineers that are, you know, they are they know how to do the calculations things but they do not know our particular business and what we do, but they do understand the physics behind it, right? So that is always interesting sometimes to go through those and explain them, which we do not mind explaining to people how this works and why it works, and these are the charts, and these are the calculations in this is what happens, but we really do not have that many nightmare clients.

**CURTIS:** That's good. You know I think your level of exposure to the clients, is a little more limited than like, you know, mine would be or even the architect, right? Because, you know, we are married to him for 12 months or 16 or 18 months and you all might be married to him for, you know, two or three months or if you are doing inspections maybe longer than that but it's a different dynamic maybe than what I have right.

**KARL:** Oh yes. Because they are looking for something that is a finished product. You know, most people go out to look at a house whether it is in the framing stage, or they look that and think oh that is nice there is a lot of wood in here, right? Most people do not really exactly understand what they are looking at.

**CURTIS:** So do you guys offer I should have asked this earlier at the beginning. We were talking about your company, but do you guys offer any other services outside of just structural and civil engineering and inspections you guys do forensic work do you do any other services we do?

**KARL:** We do offer forensic work. We do anything from civil and structural

patio additions to multi-story commercial buildings. This last year we started a Land Development Department so now we have some big land jobs that are working on to do them, to do land planning, and most customers or clients come in and say, okay, “I just bought fifty acres. I want to how many houses can I get in these fifty acres?” So, we do things like feasibility studies to check those out and make sure this is how much you can get, these are the tension requirements, this is where the utilities come from, these are where the city codes and what is required. We have to say, do you have enough utilities for one hundred houses out here on this, right?

**CURTIS:** “How are you getting power out here? How are you getting water and sewer?”

**KARL:** “So we go through all the, is it a floodplain? Is there, a floodplain running through your property, right?”

**CURTIS:** “How is it all going to drain? Where is all that displaced, water going to go to, and all these houses are built?”

**KARL:** That is right, so, we get that much acreage, you do some color hydrology analysis, as what that means is, whatever is currently draining, you cannot change that or you can increase that, so it affects people down, downstream.

**CURTIS:** Awesome. So, I guess lastly, tell us how people, if they want to work with you, if clients or Engineers or whoever is listening, if they want to work with you, how do they find

BEC?

**KARL:** Okay well we have a website of course – https://becengineers.com. May we give out phone numbers?

**CURTIS:** Sure you can give out your office number

**KARL:** Our office number is 832.240.3771

**CURTIS:** Any Social Media stuff? Do you do any Facebook or LinkedIn? Or anything like that?

**KARL:** No we really don’t. We do have on our website some links to some other, some other client or some other people, and testimonials and podcasts from other times that we have been on podcasts.

**CURTIS:** Great. So Karl, thanks so much for joining us today. I really appreciate it. I appreciate you and Reese and all the rest of the team there. You guys are always a joy to work with. Your support means a lot to me and other builders and people, and you are one of those guys that I know that I can always call, and you are going to talk to me on the phone, you are going to respond to my texts or my email. So that is always, you know, very comforting to know.

**KARL:** Thank you. Well, we truly believe that and I preach that culture and our group that I've heard of once, I've heard a thousand times is “this engineer, that engineer won't call me back or doesn't respond?” and that is it though - that is not acceptable. Even an email, to me, is just like a phone message at least if you can't respond right then you just say okay, I see your email and I'll get back to you.

**CURTIS:** Yes well, I appreciate that, it is, unfortunately, getting harder and harder to find these days. Thank you.

**KARL:** It is a culture that I grew up in.

**CURTIS:** Yeah, that is awesome. So, thanks a lot for coming on today. Great to see you.

**KARL:** Thanks for having me

**CURTIS:** And also a big thanks to you guys who are listening and watching. Thanks for tuning in to this episode of The Your Project Shepherd Podcast.

We teach here that every successful project has four key components. It is represented by a quite simple child's drawing of the house.

The foundation is planning. The left wall is your team, the right wall is communication, and the roof protects it. All is proper execution.

So be sure and check back next week to see what is up next for Our Heroes, Brian and Heather, and also to listen to a great interview **with Toner Kersting of Toner Home Matters**.

We are going to discuss building performance and building science and what that means to you as a consumer next time.

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