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Interviewer: Tom Martin (TM)
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TM: Today is September 9, 2022. This is Part 4 of a Grand Canyon oral history interview with Ronnie "Mac" McFarland. My name is Tom Martin. Good afternoon, Ronnie Mac. How are you doing today?

RM: I'm good, sir. How about yourself?

TM: Pretty good, thank you. Ronnie Mac, may we have your permission to record this oral history over the telephone?

RM: Yes, sir.

TM: Thank you. One of the things I wanted to ask you was what you knew about life before bolts. A lot of iron construction—well, all of it today, I suppose—uses nuts and bolts of high-grade steel. What do you know about actual hot rivets and riveting things?

RM: Well, from the dawn of the structural steel assemblies, whatever, you know, Carnegie kind of perfected his steel making, everything was made from laminated plate and angle before we had rolled members like we have today. So they would, you know, in the shop they would drill holes in the laminate angles to plates, depending on what they had to carry. More and bigger plates, bigger, heavier angles to make column and beam-type sections out of it for the structures. And there was an art to heating rivets. They had to be a certain temperature for them to work properly. And there wasn't enough heat guns and thermostats and thermometers and stuff back then. It was all done visually. So the guy that was working the forge or the kettle, heating them up, you know, that was an art. And he might have ten different sizes being heated up at one time. As soon as one would be ready, he would holler out to guys on the float or at a point, you know, and they had a metal catch can. And he would grab that rivet with the tongs, and he would throw it sometimes 60, 90, 100 feet.

TM: Wow.

RM: And they'd catch it with that bucket, grab it with a smaller set of tongs, stick it in the hole, and then they had a deal that's called bucking up. They would put behind it to hold it while the guy on the other side got on it with a helldog, which is what they were called—it's like a bitty

jackhammer—and pound that thing down and leave that domed rivet head on it so if the plies were a little bit off or whatever, as long as that rivet went in there, and they started hammered it down, whatever voids or differences were in there, that rivet would just fill that void up.

TM: Okay. And would they have to use more rivets than bolts? Or is it a, you know, if you were connecting two pieces of steel together, there was a plate. You'd put the plate on there. There'd be a bunch of holes. You'd line those up and start putting rivets in there to fill up all the holes?

RM: No, the only way they really use— The count wise is still about the same now as far as connecting the pieces and holding them in place. Where they used more at was having to rivet the member itself together because you'd only have a rivet, like, every three inches or so, or a double row of rivets just to hold the member together because it was all laminated together. Where nowadays we have rolled shapes for columns and beams and big beams. I mean, they'll roll up to like a W44 by, you know, 700 pounds a foot.

TM: Okay, let me make sure I understand that. There's a guy working a forge, and he's going to get this rivet white hot. I mean, it's got to be hot.

RM: It'd be glowing orange when he'd pull it out there and throw it to them guys.

TM: Okay, and he would call out to them so they would have to have, as you mentioned, the catch can. They would have to have that ready when he got the tongs and flipped it to them. Now, one of the things I think of right there is if he doesn't throw that thing right and it's off a little bit, the guy with the catcher might want to lean out for it.

RM: He would have to. And I've seen battle scars for some of them old timers that would miss, and that rivet would hit them. Of course, you know, just being hit with a super-hot branding iron, it would leave an ugly scar.

TM: Wow. Okay, so that's something else I hadn't thought of.

RM: You know, it only touched him for second or so, but it was so hot when it hit him, it'd leave a mark.

TM: Oh, I bet. I mean, it would burn right through their clothes if it's anywhere near 700 or 800 or 900 degrees. I had never thought of that. I'd always thought about the danger of reaching out too far to catch the thing, then you lose your balance and you're on your way down somewhere. I hadn't appreciated—

RM: Most of them guys were sitting down on the beam so you could hook a foot, you could hook your heel on the backside of the beam you're sitting on. You could lean out there a pretty good ways and still maintain your balance. And I'd heard that those guys that worked the forge, they got paid piecemeal, so much a rivet. They won't let nobody work piecemeal nowadays, but back then a guy that was real good on that forge was worth his weight in gold, especially if he could, you know, one forge could feed five or six different pairs of guys bolting up. And that guy would come in early, make sure he had his forge going and had rivets ready so when everybody else started, he was ready to go.

TM: Got it. That makes sense.

RM: And I've heard some of them old timers tell me the guy on that forge, you know, he'd making three times the money that everybody else was making. But a lot of people didn't want it because you're just standing in one spot and it's hot in the summertime. It's got its benefits in the winter, but you're just steadily monitoring that, you know, chucking them rivets.

TM: Right. I bet you'd get good at it, but still, with your wrist, you know, after a while that's going to start taking its toll, especially when you've got a heavier rivet that might be five or six inches long. Pitching that thing out there is going to get old after a while.

RM: I've seen videos of them guys, you know, chucking them, and I mean, there was an art to it. They'd grab it with that tong, and you had to— It wasn't so much the wrist. It was just like from the elbow down, you know, that lower part of your arm.

TM: Yeah, I absolutely appreciate there's an art to that. It'd be nice in the winter time because you'd be hanging out by something kind of warm, actually pretty hot. But in the summer, oh, man. I just had not appreciated if you don't get out of the way of that rivet coming at you and it beans you, whether it hits you on your arm or your leg, yeah, that's a bad day.

RM: There was art to every aspect of it from the guy heating them to the guys catching them and bucking them up. It wasn't for the faint of heart.

TM: No, and they had to be fairly quick, I would assume, because the rivet, as soon as it left the forge, would be cooling off, and so they—

RM: Yeah, but they had them so hot that, I mean, it wouldn't just— You know, you probably had, from the time it left the forge, you probably had five minutes before it would cool down enough before it might affect you on the way it would drive up.

TM: I hadn't thought about that, either. As soon as you put it in the hole, it's going to start cooling off even more because now its heat is dissipating into the steel that surrounds it.

RM: Yep.

TM: So then you gotta get on it fast there. So the helldog, the air hammer on one side and bucking up on the other side. Was there a tool that you used for that?

RM: Yeah, it was, oh, maybe 8, 10-inches long, and it had, like, a screw jack on the end. You can put something behind it for it to buck up against and run that end down to where it hit that rivet. And that way when the guy got on the other side, you know, it wasn't shoving back on you every lick. You held it tight in there, so when the guy was hammering it down, you had a lot better effect.

TM: Okay, help me out with this. I can think, alright, I've got a tool that's, you know, 8, 10-inches long. And if I could wedge that tool against something else, then the guy with the helldog can just wail away on this thing, and my rivet's not gonna go anywhere. It's not going to back out

because I've got it wedged in there pretty tight. But I would imagine there would be a lot of instances where there is nothing to buck that tool up against, and you've just got to lay into it.

RM: Well, those guys were pretty creative. I mean, I'm sure in some instances they had to leave a rivet out so far back to where they could drop a rod down in there to buck that up against. And then the guys would, you know, once they had the other bolts tight, then they would put that rivet in.

TM: Okay. Let me make sure I understand this. Basically, if I could hold the buck-up tool and I could brace it on the other side of the iron with, like, a claw reaching over, then it wouldn't go anywhere. Then the helldog guy could get it on his side, and the claw would reach over and get it on the helldog guy's side anyway to hold the buck-up tool in place. Does that make sense?

RM: Yeah, kinda. I mean they'd had to put something behind of the buck-up tool to make sure it held in place. But I said, those old timers, they's pretty creative.

TM: Wow. Okay. Well, now you've inspired me get on YouTube and see if I can find some YouTube film on how that's done, or how it was done.

RM: I'm sure there is. I mean, there's some footage of, like, when the Empire State Building was being built. There's probably some footage of the Golden Gate, Oakland Bay Bridge, you know, some of them whenever they was erecting those.

TM: Okay. cool. Well, thank you. I appreciate that touch back to the past.

RM: And when they would hang the iron, the bolts they would use to hang it till the rivet guys got there had square heads on them. That's before we had the octagon-headed bolts like we have nowadays.

TM: Oh, so back me up a little bit. What you're saying is that the bolt-up guys would actually use these square-headed bolts, and the rivet guys would then come in and rivet and eventually pull out the bolts and rivet up those holes.

RM: Well, you just start with the raising gang were just hanging it on temporary bolts. The bolt-up crew would come in and drive pins to line the holes up and then use a few bolts to make sure the iron was drawed up tight, you know, like, on each side of the column or the beam or whatever the members were connected to. Because they started putting rivets in them other holes, then they could take those bolts out.

TM: That makes perfect sense.

RM: And nowadays we just use bolts. You know, we try to monitor to make sure we're putting the right size in each point so when the bolt-up crew comes by there now, there's no changing nothing out.

TM: Okay, so the temporary bolts now become part of the structure.

RM: Well, we don't have temporary bolts now. We just use permanent bolts when we're hanging.

TM: Right. When I was thinking of temporary bolts, that's back in the rivet days. So now, the raising gang uses real bolts that are going to stay there. And then the bolt-up crew comes along and just finishes the rest.

RM: Yep.

TM: Which is what the rivet crew was back in the days of rivets.

RM: Yep.

TM: Alright, that makes sense.

RM: You know, back then— Like nowadays, two good bolt-up guys could keep up with one crane hanging iron pretty easy. Back then, you know, it would take six or eight guys, maybe even 10, to try to keep up with one crane hanging iron just because it takes so much longer with having to heat the rivets and the process.

TM: Right. Yeah, I mean, somebody's got to keep the forge guy in coal and in rivets and keep him supplied up. Somebody's got to catch the rivet. Somebody's got to buck it on one side. Somebody's got to helldog on the other side. Somebody's got to put the rivet into place. Right there you've got, you know—

RM: Usually the guy that caught it put it in place. He would catch it and reach in there with a small set of tongs to grab the rivet and stick it in the hole, and then he'd clip the buck-up tool on it. Then the guy on the other side would use the helldog and hammer it tight. And then as soon as the next rivet was ready, they'd throw him another one.

TM: And in theory, there were, well, two or three or four of those crews, that the guy that's catching and the guy that's bucking it up. And so the forge guy can be throwing rivets to three or four teams, not just two guys. Is that—?

RM: Yep. Well, now, on one of the bigger projects, you know, I wouldn't be at all surprised even on the old Navajo Bridge when they did it, they probably had probably two guys on the forges on that. And then, you know, you get on the bigger bridges like the Oakland Bay Bridge or the Golden Gate or some of them, oh god, I don't know how many different forges they had going.

TM: Right. That makes sense. So on Navajo, you might have—you could have two forges: one on the upstream side, one on the downstream side.

RM: Well, I mean, they erected the old one the same way we did the new one. They did half and then moved over and did the other half because you'd have, say, one up towards the roadway surface and another one probably set up down below.

TM: Oh, you'd do it that way. Okay.

RM: Or one on one side; one on the other.

TM: Right. Okay, that makes sense. Yeah, definitely a little faster now without all that, without a forge, and you still got pneumatic tools to tighten up your bolts. But you don't have to whale away on stuff like those guys were doing. That must have been loud. Were those old timers deaf that you were working with? I can't—

RM: A lot of them were. But a lot of these big air impacts we use in my career, you know, are just as loud, and lot of guys complaining about it. But I mean, I still hear perfectly fine, and I've been around them my whole career.

TM: Did you use ear protection?

RM: No.

TM: Okay. Alright. Yeah, kind of wonder about— Well, rivets just sound like the potential for getting hurt is pretty good, and I imagine that only happens once or twice. You either learn or you hang it up. To get hit by a piece of steel that hot, that's the sort of thing a person does not want to repeat.

RM: Well, it's a tough trade. It kept a lot of people out of the trade that didn't have any business being in there. I mean, you separate the men from the boys real quick.

TM: Well, with that kind of thing, I think you'd need to be real dexterous, too. I mean, you'd have to be quick on your feet to be able to get a really hot piece of steel like that where it needs to go and then pound it into place. You know, you gotta be good. Well, alright, let's move forward then back to 1994. You guys had gotten the Flagstaff side built out and then moved a bunch of—moved everything over to the—

RM: We moved everything to the lodge side.

TM: What went over to the lodge side? What did you move?

RM: We moved the crane that was on the traveler plane that we used to erect the bridge with. We moved two 40-foot sea containers that we used to store bolts in, air compressors, gauge boxes. I mean, all tools, everything moved to the other side. And that took probably— It was probably three weeks doing all that. We busted the crane down. They had to haul it around the long way. Got everything else moved over, crane put back together, ready to start erecting. So it's probably about three-week deal in there we're getting all that stuff moving back in workways.

TM: Okay, we talked about this once before, but I want to capture it again. When you mentioned the long way around, can you describe that?

RM: Well, they had the trucks; we'd load them up with the crane and the heavy parts, and they've had to drive back down to Flagstaff, go to Kingman, go over the Laughlin, up to Vegas, up to Saint George, and come down through Fredonia, down by the North Rim and down that way to get to the—

TM: Yeah, Jacob Lake.

RM: Yeah.

TM: Okay. I'm also thinking about the bridge at the Glen Canyon Dam. Was that an option to go that way or was there a—

RM: Well, we didn't. I don't know if it was a weight restriction or what. I think it was a— Of course, you gotta get a permit to do it. Of course, they're gonna permit you on less traveled roads but that's just to what ADOT had us permitted.

TM: Okay. That's a long drive around. You mentioned a story about getting some sort of crane across the old bridge. Can you recount that again?

RM: We took that 80-ton hydro that we used to unload trucks and load our dolly platform with material on. We drove it across that old bridge, oh god, probably four or five times.

TM: And so the old bridge handled that. I'm assuming you weren't driving it very fast.

RM: Well, no. And we had traffic blocked off on both sides. And then me and David Meche walked with the crane across the first two times, watching to make sure we wasn't stressing or about to buckle a member down below. After we'd made a couple trips, we weren't too worried about it anymore after that.

TM: Okay. And was the 80-ton crane, was it carrying stuff across?

RM: No, it was just carrying itself.

TM: Okay. Why did it have to go—

RM: It started out we had it on the Flagstaff side because we had to unload the iron for that half of the bridge on that side. And it would keep if we would load material on to take out to the crane, you know, for each panel point as we was erecting it. Well, after we got done and we got the traveler crane back to the bank and tore down and it loaded up, and those trucks left, then we had another truck that we would load one of those 40-foot sea containers that we'd store bolts in it, let him drive across the old Navajo Bridge, and then we'd bring the picker across to unload it. And we'd drive back across till the truck would come and we'd load the other one up. I mean, we just—

TM: Got it. So you were running the 80-ton back and forth to unload the containers and other stuff.

RM: Yep. About the time the trucks made the route around and got back in there, we'd already set the first two short spans out from the abutment going towards the cut in the cliffs. We had that set and the track way laid out so that when the crane parts started showing up, we could put the traveler train together and then put the crane together on top of it.

TM: Alright. So the crane, the building crane, you were able to assemble that, put it back together to get out to the first panel off of the skewback foundations.

RM: Well, it was back, you know, 30 feet or so before you got to the cut where the first tall plumb post come up from the anchorage. He'd reach around behind it, grab a plumb post. Well, we'd set the shoes first. Then he'd reach around behind him, grab a plumb post, bring it over to us. And we'd set it to the shoe and then we'd have a temporary brace that we would put against the cut back toward it to help hold it in place till we got up there high enough we could tie it back to the structure before you got to the main span of the bridge.

TM: So the plumb posts weren't full height. They were sections?

RM: Yep. I think three.

TM: Okay, so once that's built up high enough, then you can get it back into the tie backs bolted into the land to keep them from tumbling down into the river.

RM: Yep. From that switch, we was probably three or four days setting that and the first panel point out. And then we'd moved the rig ahead and then set the next panel point. Those are the taller ones. So we'd be about a day and a half after we got the first one built, setting in, and then after, like, the third panel point, we'd do a panel point a day.

TM: As they got smaller.

RM: Yeah.

TM: Okay. So it seems, like, within a couple weeks you would have just marched right on out there.

RM: Yeah, it didn't take long. Everybody kind of learned the drill by then, so they knew what to do and every step and all that. We was already passed the learning curve. Every time you start a new project you got guys that had never done it before, especially if it's a complicated structure. You gotta go through the learning process to teach them, you know, what to do, what to look for. All that good stuff.

TM: Ronnie Mac, you had mentioned Ed Kent, the superintendent of the job, had a rock he sat on to kind of watch what was going on on the Flagstaff side. Did he find a similar rock on the lodge side?

RM: Yes, he did.

TM: And he called out a couple things on the Flagstaff side. You mentioned that in an earlier interview. Did he call out some things on the lodge side as well?

RM: Oh, yeah. If he thought we weren't going fast enough, he'd be on there. You know, he'd be on that radio, "You need to do this," or "You need to do that," or "What's taking so long?" I mean, just typical ol' bridge superintendent. It don't matter how fast you're going, it ain't never fast enough.

TM: That makes sense, I suppose. A superintendent's like, "Come on, get going. Oh, you're going fast? Well, go faster." Yeah.

RM: Yeah, and I had to remind him on that second half, they got to be a little too gung ho. I'm just like, "Hey, you remember when I got here if you got a panel point every three days, you was happy. Now you're getting a panel point a day plus all the floats jumped, the dolly reloaded. I mean, you ought to be careful what you wish for. We'll go back to the three days a panel point."

TM: Wow. And was that three days a panel point, was that because people were new to what was going on and didn't quite have a system figured out?

RM: No, I think that's what was allowed in the original schedule.

TM: Okay. Well, take me off to a little rabbit hole for a minute because if I know the schedule is I got three days to build the next panel out, and I can do it in a day, I'm gonna lose two days of pay if I do that.

RM: But, you know, when you're in supervision you don't look at it that way. The whole deal is, you know, make the company money. So if you can do it in a day versus two days, you save them two days-worth of pay for all the guys and equipment cost and all of that, so it makes a big difference at the end of the job. And that's why they're called the foreman, you know, pushing the crew because you gotta keep pushing them because otherwise they'll just lay down on you.

TM: Okay, so the crew's incentive is to drag their feet to get that extra day's pay. The superintendent's trying to get ahead of what's been scheduled, because when a job's done, like you say, it's expensive for renting equipment and paying salaries for crews that are out there. If the job is done sooner, you're still going to get the same amount of money to build the bridge. The employees aren't because they're going to finish up sooner.

RM: Yeah. But a lot of times, too, the incentive, like, for the superintendent— And I've done a lot of projects to where my bonus would be based off of unused man-hours. And it would vary per job, but most of the time my standard deal would be 30% of the unused man-hours. Three panels, three days a panel point, and I was doing it in a day. Well then, by the time the job's done, say, I have saved them, you know, 30,000 man-hours or 5,000 man-hours or whatever it was, it could mean anywhere from, you know, a $5,000 bonus to $60,000 bonus. And it really didn't cost the company anything because it was all the extra profit I had made for them. So they made all of their profits that they had hoped for when they did it, plus extra.

TM: Got it.

RM: And I've done a few jobs at that same deal, then when we get to the end, and they find out how much my bonus was, then they'd want to renege on the deal, you know. The greed factor would set in on them.

TM: Hmm. Ronnie Mac, would the raising gang and the bolt-up crews, would those guys see some of that bonus as well if they busted it out and—

RM: A lot of times, yes, especially if you have company guys that work for you all the time and travel with you. And I'd usually try to make them part of my deal too, you know. Once I knew what mine was gonna be, I'd just be, like, "Okay, here's a list of guys. I want them to get something." You know, whether it be $2,500 or $5,000 or whatever, to just let them know that they was appreciated.

TM: Right. That makes a lot of sense because if you're ahead of schedule and you know the money's going to be made anyway, hey, reward that crew.

RM: Not every company does that.

TM: Well, I bet the ironworkers figured that out pretty quickly, who actually is generous that way, and who is not.

RM: Usually what I do if they don't have a bonus incentive, well, then I just up my hourly rate to kind of compensate for that.

TM: Okay.

RM: Because you still got the same amount of heartburn to run the job.

TM: Right.

RM: And if they don't care enough about the guy running it to kind of give him an incentive to do good and watch job costs and make a profit, well then, my duration with them guys would be very short lived.

TM: So it must have been kind of exciting when you guys were just a couple panels out, closing up that gap.

RM: Well, I mean, they were taller but there's probably only maybe 20 more pieces than the shorter panel points because you had some horizontals that went from panel point to panel point. And then at the panel point line, you had vertical X-bracing that went in there. That's why it'd usually take about a day and a half to set those because of the extra pieces you had. And then once you drop down, it wasn't just going any faster. You just had less pieces to deal with, which made everything just go that much faster.

TM: Right. Yeah, there's sort of three tiers. And the further out you go, suddenly there's two tiers. And the further out you go, then there's one tier. The last top tier.

RM: Yeah. And then, like, I forget now, and I stopped by there when I went home a couple of weeks ago. Then you got, I think, four or five panel points. It's just top and bottom chord. It got short enough they didn't need that extra horizontals in there to help stabilize the taller plumb post. And that's their functions. The taller the plumb post is, it's gotta have horizontal support so it don't want to buckle under load, being that extra length. So that's their function of why those are in there.

TM: Okay. I don't follow you, but I would if we were standing there, and you were pointing with your finger.

RM: Well, you can only do so much over the phone.

TM: Yep. That's right. When you got the two— Well, when you got the lodge side, like you had one more panel to go, was it pretty clear that the alignment looked pretty good, or did you have to start kind of tweaking things a little bit to bring that alignment together?

RM: No, we had to tweak it because you got the Flagstaff side just hanging out there. You just can't leave it out just hanging out in space.

TM: Right.

RM: So when the sun comes up of a morning, you know, it just draws that bridge towards the sun, and it would pull that bridge over, you know, maybe six inches out there on the end. Then about noon or so, it would come back to about center where it belongs. Then late in the day, it would pull it to the west. So then when we got out there to make closure, which is what we call it when you're tying the two halves together, well, we got the crane and the traveler on the lodge side. So that extra weight is making that side droop down more than what the other side is. So when we went to set those last bottom chords and get it where that pin would line up and all that, David Meche would work the jacks on the lodge side that was holding us back. And then Ed Cross would work the jacks on the Flagstaff side. Get up on this one, run out on that one, get them pulled around at elevations to where they matched up before they were married together. And even as complicated as that sounds, it really wasn't that bad. It probably took us maybe an hour, hour and a half to get it perfect. But Ed Kent was out there in the middle, and he would tell us, you know, "Okay, downstream Flagstaff side, add a shim." Well, we'd get up on that jack and add a shim. Then we'd let back off on it, and he'd read it and say, "Okay, lodge side, upstream side, need to take the shim out," or add it or whatever, you know. And we'd just do it about a shim or so, about a quarter at a time. That's about the smallest shim we have was a quarter.

TM: Quarter inch?

RM: So we'd just do it in quarter-inch increments, tweaking, you know, one side then the other till we got them lined up. And then Ed gets on there, "I think we can make it there." Well then, we'd head back out to the center, get the splices tied together, slide the pin in there, finish hanging it.

TM: So I'm kind of working out the math—well, not really in my head—but I'm thinking if you moved a quarter inch over at the rock foundation side that—

RM: Oh, it would be in the inches out there in the middle.

TM: Yeah, it would move a lot out there!

RM: Yeah.

TM: And you've got the temperature differential playing with it, so—

RM: That steel will expand one-eighth for every 10 feet for every 10 degrees above 75. So you gotta take all that into account.

TM: And so once these pins are in place, the pins, if I get this right, are about, what, two feet long and, I don't know, four inches in diameter?

RM: No, they're probably 12 to 14 inches in diameter.

TM: Oh, a lot bigger.

RM: And they'd be close to three-foot long.

TM: Okay, and there's one on the downstream side, and one on the upstream side.

RM: Yep. And they're just looks on the new one.

TM: Right.

RM: They're not doing anything structurally. Now, the old bridge, each half is bearing against that pin.

TM: Right.

RM: But they wanted to resemble and look like the old one. So they put the pin in there. Like I said, it's only function is just for esthetics.

TM: So once it was in, then they actually bolted across the two halves and just made them into one then?

RM: Well, the way the splice plates were made, like, with the bottom chord for their being married together, those splice plates were long enough to catch both sides, both bottom chords. So that's what took so much longer to line that up because you had to get those bolt holes to line up. We needed to bolt them together.

TM: Wow.

RM: And then once we could start driving pins, you know, and getting it tied in there, then the big pin for looks, it just slid right in there. Then there was a keeper plate that keeps it in there, keeps it from falling out from road traffic vibration and all that kind of stuff.

TM: Right. Keeps it from going upstream or downstream and falling out.

RM: Yeah.

TM: So that day when you put those two halves together, did you go ahead and bolt those splice plates in?

RM: Oh, yeah.

TM: Okay. So at the end of that day, that was done.

RM: Yep.

TM: Now, there's a picture— I think I sent you that photo, and you very kindly were telling me some of the names of the people in that picture. It sounds like that all was done about, I don't know, mid-afternoon or something like that?

RM: It was probably about 2 o'clock in the afternoon by the time we got both sides married together.

TM: Okay.

RM: Then we went to the lodge and started drinking whiskey.

TM: Right! Because it wasn't going anywhere finally. That bridge wasn't gonna go anywhere.

RM: And then we went in the next day to finish hanging the iron, all that good stuff. Get ready to start moving the crane back to the abutment side so we could tear it down. I mean, the crane was out there for probably three days after we set out because we used it to get all the floats jumped out of there, you know, pulled track up as we moved it back.

TM: Okay. So the pins are on the bottom chord, and then you bolted that together. And so to finish the iron, you would have had to then build up to the top chord to put the—

RM: The top chords just terminate at the plumb post. You got a plumb post on each side that's holding the top chord up. So that's their expansion at the top. The top's not tied together, so that will allow for any thermal expansion and that kind of stuff.

TM: Ah, okay. So there's a little bit of wiggle room for the top chord, but the bottom chord is bolted together.

RM: Yeah, because the bottom chord all the compression. That's what's holding everything up.

TM: Okay. Right. That makes sense.

RM: And then the top chord, it's just holding the roadway.

TM: Good. So it has no need to connect side to side. It could, but it doesn't have to. Alright, so then you had to pull up the crane way. The crane had to back out. Now, when that crane backed out, the lodge side of the bridge would have wanted to come back up because it didn't have that crane holding it down.

RM: Well, but we had them locked together at the bottom chords.

TM: So it didn't matter.

RM: No.

TM: Wow. That's some pretty tough construction there.

RM: It would have came up some, but it would be compensated with having to pull the other side up as well.

TM: Right. So I guess that would have put the whole bridge then in a little bit of a, kind of like a semi-trailer. It kind of has an arch in it, and then when you load it up, it flattens out.

RM: Yeah, it's called camber.

TM: Okay, so the bridge, once the crane backed out, would have cambered up a bit.

RM: Well, no, not really. Because once we had everything made and bolted up, we released the jacks that were holding it together.

TM: Okay. Alright.

RM: So then it was all this dead load for what it was designed for. You know, those bridges are designed to have bumper-to-bumper loaded semis in each lane from one end to the other.

TM: Wow. Okay.

RM: Plus a safety factor.

TM: That makes sense. I was thinking about the old bridge in the 1950s when Reclamation was building the Glen Canyon Dam. They would have used that Navajo Bridge to get stuff from one side of the canyon to the other.

RM: Well, when they did the Glen Canyon Dam and that bridge, they used a highline system. Once the highline system was up, it could grab material from either side.

TM: Right. Okay. But before that bridge was built and the highline system was up to swing steel back and forth across the canyon—

RM: Well, I don't know who done the Glen Canyon Dam, so I'm not sure of which route they would have come, bringing their material in there.

TM: Right. They had the train in Flagstaff, but they did a lot of stuff in from Kanab, so they would have had to work that out anyway. The Navajo Bridge would have been heavily used to help them connect, you know, whatever they got to do, one side or the other side. I was just kind of pondering that the other day. But now with the new Navajo Bridge and the Glen Canyon Bridge at the Glen Canyon Dam, that kind of helps a lot just to have fairly heavy-duty bridges there now in place. Did you have any—

RM: That bridge there at Glen Canyon Dam, that would have been a nice one to work on. I think they build that, what, like, in the early ‘60s or so.

TM: No, that was in the ‘50s. That thing went up really early on in that project because they knew they needed to get across the gap. They had, you know, cables across and all that kind of stuff, and they were swinging out giant loads of concrete and all that stuff. But that bridge went in pretty quickly, ‘57 or ’58. I have to look, but it was early up.

RM: I’d be curious to see who the erector was on it.

TM: I could probably figure that out and get that to you. There's a picture I saw—I think I know where to go find it—of the raising gang standing out there when the two halves came together. There's a good dozen guys out there. Of course, there's no ropes, no safety netting, nothing. They're just standing out there. I'll send that to you.

RM: Well, they were pretty adamant about the safety nets even way before, you know, any kind of the stuff that we have nowadays come into play.

TM: I'll have to look for that because I'm sure it was there, but I don't remember seeing it, so I'll have to look. I'll send you what I've got for that. You can take a look. It'd be interesting to see what you say when you see that, what it makes you think of. Because, yeah, that would have been in the late ‘50s. And I'm assuming they bolted that. They didn't rivet it.

RM: No, that was a rivet job.

TM: It was? Okay, alright.

RM: The bolts really didn't come into play until the mid ‘60s.

TM: Okay. Alright. Huh. So what do you think— I just keep thinking about Ed Kent and his tombstone. Just four letters. It says Kent, and then there's that design of the second bridge. The crane’s out there. There's a little gap between the Flag side and the lodge side. What do you think that bridge build meant to Ed?

RM: Well, all of them meant a lot to Ed because he took a lot of pride in being a good bridgeman. But that was getting close to the end of his career. And the way we did it, you know, you just don't do very many of them across a canyon like that where you can't use the big derricks or the big cranes on the barges like most of them were done.

TM: Yeah, you couldn't touch the bottom.

RM: If you’ve got a picture of Ed's headstone, I'd like to see it.

TM: Okay, I'll send that. Do you have any thoughts now looking back on that build and amongst all the other builds that you've done?

RM: Ah, it was just another job, 28 years later.

TM: Okay. [Laughs] Yeah.

RM: When I was driving home a couple of weeks ago, I stopped there, walked across the old bridge, looking at it, you know, reminiscing about when we built it. Then I got to adding up. I was, like, holy shit, that's 28 years ago. It doesn't feel like it's been that long ago.

TM: Yeah, you're right. You're right. Well, I mean that's why Ed's gone and—

RM: Ed Kent's gone. Ed Cross's gone. Greg Reese's gone. The only ones left is the crane operator, Andy; David; and myself. But, you know, a lot of the guys who worked on it, they're still alive.

TM: Right. Right. Where is Andy? How would I get in touch with him?

RM: I'm friends with him on Facebook.

TM: Yeah, can you connect us up?

RM: I'll see if I can get a hold of him.

TM: That would be great. Thank you. And if you're heading across the Marble Canyon Bridge sometime soon, I'd be honored to drive up there and meet you and get my little recording gizmo and just have you point some things out to me, if you'd be willing.

RM: Yeah, that's fine.

TM: That would be fun. When do you think that might be happening?

RM: Well, if I ever get done with the decking on this bridge I'm on, probably sometime around the First of October.

TM: Okay. Alright, well, let's keep that in mind because that would help me just, kind of, with you pointing out stuff. And it would be really— It'd be an honor to have you talk about the build from the old bridge, looking at the new bridge. That would be fun. Ronnie Mac, is there anything else about this build that you want to add to this oral history?

RM: I think we've covered about everything there is to cover.

TM: Well, I've sure tried. There's few people around that remember that build that you did, and I really appreciate your taking the time to go through this in such detail. It's an honor to spend time with you and have you recall this and how it all worked out. I'm very grateful for you taking the time to do this.

RM: I'm just glad somebody thinks enough of it to want to do a history on.

TM: Well, I wish somebody had taken the time to do it on the first build.

RM: But that was, like, during the Depression. People were just happy to have a job.

TM: Well, that's true. We don't think about it at the time, and suddenly it's too late. So again, I appreciate your taking the time to do that. Well, Ronnie Mac, this has just been really wonderful. Thank you again for doing this with the Grand Canyon oral history program. I think with that, we'll go ahead and conclude this series and end Part 4 of an oral history with Ronnie "Mac" McFarland. Today is September 9, 2022. My name is Tom Martin. And Ronnie Mac, thank you so very much.

RM: You are very welcome, sir.