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SLIPFORMING EVERY INCH

Carl Buchanan started his contracting business in 1969 in Whittier, North Carolina. He set up his business behind his house and he and his crew took on several unique construction projects.

Carl and his wife, Alice, had three sons, Mark, Carl Jr., and Chris, and Buchanan evolved into Buchanan and Sons Inc. as each of them joined the company. In 1999, Buchanan and Sons, a company never afraid to take on new applications, went into slipform paving. They purchased a GOMACO GT-3600 curb and gutter machine and took their company in a new direction.

“Dad would run a crew of 20 men and they could hand pour 500 feet (152 m) in a day,” Chris Buchanan, vice president of Buchanan and Sons, said. “That’s the beauty of the GT-3600. With the machine and just four men, we can pour 900 feet (274 m) of curb and gutter in just three hours. There’s no way we could do what we do handforming.”

Buchanan and Sons are slipforming both curb and gutter and sidewalk

most of the time with just a four-man crew: a chute man, Chris as operator, and two finishers. In fact, the company itself consists of only nine people, three of whom are the Buchanan brothers.

Their curb and gutter projects average anywhere between 400 to 5000 feet (122 to 1524 m). Sidewalk projects range up to 10,000 feet (3048 m). They own a total of four curb and gutter molds and just one for sidewalk.

“All of the curb and gutter has a three inch (76 mm) radius on the face and a three inch (76 mm) radius in the flow line,” Buchanan said. “It’s a state standard. Even if we’re working in town, it will involve state right-of-way and we have to pour it according to state standards.”

Buchanan and Sons projects take them all over the state of North Carolina on a variety of projects, all of them with challenges that include tight

“That was the whole principle when we bought the machine. I said, ‘Boys, when we buy this machine, we’re going to pour every inch we can,’” Buchanan explained. “I don’t like having to go back and form five to 10 feet (1.52 to 3.05 m) fill ins.”

radii, clearance issues and drainage and driveway blockouts.

“There are really no big projects around here,” Buchanan said. “A decent sized project is 7000 feet (2134 m) of curb, but even that’s guaranteed to have at least 2000 feet (610 m) of driveways.”

The curb and gutter work includes radii of all sizes, from as tight as 24 inches (610 mm) all the way up to 15 feet (4.57 m). Buchanan uses PVC instead of stringline for their tighter radii. They set their stakes a minimum of 12 inches (305 mm) apart and use several clips to hold the PVC tight.

“Three to 3.5 feet (0.91 to 1.07 m) radii are pretty common for us,” Buchanan said. “The PVC is easy for us to set up. We’ll put our stakes every 12 inches (305 mm) and, the tighter the radius, the more pins we put in.”

The GT-3600’s ability to turn a tight radius is one of the reasons they wanted the machine. Buchanan likes

Slipforming tight radii isn’t a challenge for the Buchanan’s and their GT-3600.



the two sensor system the GT-3600 utilizes while turning a radius.

"That machine will just pour round and round those radii. It's the reason we bought the GT-3600," Buchanan explained. "I watch guys with other machines out there trying to get around a corner. They'll be on the side of the machine cranking away and that just doesn't make sense to me."

Buchanan has three rules that always have to be followed on a radius pour. Number one, never touch the sensors; number two, always do a trial run; and number three, always undercut the grade by one to two inches (25 to 51 mm).

"No one touches my sensors but me. It's a rule. I know where to put them and where they work best. If it's a tighter radius, I'll slide the number two sensor back a little bit before we start, but I never play with them once I start pouring," Buchanan explained. "I always do a trial run without concrete and we always trim low and undercut the grade. You'll lose some concrete, but it's well worth it. If the mold catches when it's going around that radius, you don't have a prayer.

"Another thing that's important about radius pouring... a good concrete truck driver and a good chute man. You don't want to have to stop in the middle of a radius. I like to talk with the driver, tell him which way I'll be swinging around and it helps keep the truck in position and avoids awkward angles that cause problems."



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North Carolina sidewalk is slipformed four inches (102 mm) thick and five feet (1.52 m) wide.

Buchanan trims and pours simultaneously on all of their projects. They'll trim through everything, from dirt to rock.

"We put the John Deere engine in our machine and it has plenty of horsepower," Buchanan said. "On a project in Forest City, I was trimming two inches (51 mm) of stone with our five foot (1.52 m) trimmerhead and laying down five foot (1.52 m) sidewalk. It was all that ready-mix truck could do to turn its blades fast enough to keep it going. The GT-3600 was just ready to go."

The GT-3600's vertical-lifting trimmerhead cuts down on tie-in work and is a real time saver for the company's small crew. The GT-3600 can trim right up to the drain, Buchanan vertically lifts the trimmerhead up and over the drain allowing the mold to slipform right up

against the box. The mold can then be lifted, and the machine can travel across the drain without leaving the stringline. The mold is then lowered to grade and slipforming continues.

"I'll just pour right up to the box, pick everything up, go over it, drop the trimmerhead and take off pouring," Buchanan explained. "There isn't but a foot or two (305 to 610 mm) on each side of the box that has to be handworked."

Selective steering and all-track control also help save time and effort. The different steering modes help Buchanan get his machine on and off line and around obstacles faster with less fill-in work.

"That was the whole principle when we bought the machine. I said, 'Boys, when we buy this machine, we're going to pour every inch we can,'" Buchanan explained. "I don't like having to go back and form five to 10 feet (1.52 to 3.05 m) fill ins. I use all-track and crab steer the most. I can walk right up to or away from the stringline."

Buchanans have worked to adjust their slipformable concrete mix design for their projects. They like to use a mix with a 4500 psi (31 MPa) and a high cement content.

"It has 555 pounds (252 kg) of cement per yard and it'll run about 95 pounds (43 kg) of fly ash," Buchanan said. "In the summer we'll run 100 percent retarder just to keep the mix cooler in the trucks. The



CG-090209 D3

retarder gives us standby time. The DOT, once you add retarder, will allow you an extra hour standby time.”

Slump averages between two to 2.5 inches (51 to 64 mm) for curb and gutter. Control joints are handformed every 15 feet (4.57 m) with expansion joints saw cut in later every 90 feet (27.43 m).

They pour sidewalk a little wetter with an average slump of three inches (76 mm). It also requires a little more work. Control joints are placed every five feet (1.52 m) with expansion joints sawed in every 50 feet (15.24 m).

Finishing work is kept to a minimum. A bull float Fresno finish is applied before it's broomed. Joints are then added to finish the product.

“I would love to pour sidewalk every day of my life. It's just pretty,” Buchanan said. “People drive all over our curb and beat it all to death, but our sidewalk stays nice.”

Slipforming the two different applications requires a lot of mold changes. According to Buchanan, it's an easy process, even when switching from curb and gutter to sidewalk or vice versa.

“All you have to do is take the hold-down bar off, pop out two pins,



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slide it on the mold, adjust it a little bit and you're ready to go,” Buchanan explained. “We even purchased enough vibrators so we can keep the the same ones in each mold. We're not having to switch those around all the time. All we have to do is plug them in and we're ready to go.”


Buchanan takes their quality of work seriously. They learned from their father not to cut any corners or get by with short cuts. That philosophy is applied to everything, even machine clean up.

“At the end of the day I'll spend 45 minutes to an hour with the pressure washer cleaning up the machine to my standards,” Buchanan said. “Every time it's back at our shop, I'll get my bucket and car wash out and really go over the machine good. I'll even get out my scouring pad to get all the little concrete specks off.”

“Our machine still looks brand new. We just take care of our equipment. It's the way our Dad raised us to be.”

With one project complete, the machine nice and clean, it's time to head to the next. Buchanans load their GT-3600 on a standard tag-along trailer and haul it from site to site behind a dump truck.

The versatility and easy transport of their machine will be utilized fully with their busy fall schedule of work.

“The GT-3600 is a manly machine,” Buchanan said. “I like everything on it and it really works well for our company. It's great to operate, too. It's just fun. That's one thing about this business, don't just be in it for the money, be in it for the fun of it and the pride of doing a good job. If you do that, the money will take care of itself.” 



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Three secrets to slipforming tight radii: always do a trial run, trim low and undercut the grade, and communicate with the ready-mix truck driver.



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Www.buchananandsons.com features more pictures of the GT-3600 at work.