
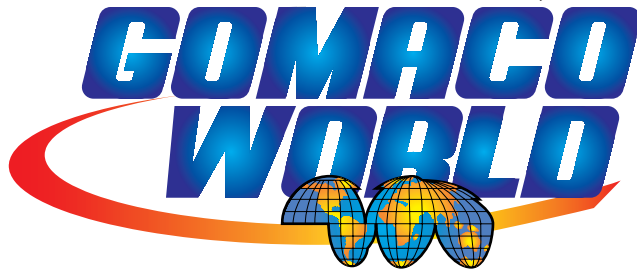


COMACO WORLD





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Bar Insertion Accuracy and Paving Production on a California Highway



Photos by Travis Brockman HW-080705 D28

Security Paving Company slipformed 18 miles (29 km) of new concrete roadway on the Highway 23 project. They used their new GOMACO GP-4000 four-track paver with In-The-Pan Dowel Bar Inserter (IDBI) to pave the new roadway.

The traffic on California's Highway 23, a major roadway in Ventura County, has grown from an average of 87,000 vehicles daily in 1995 to about 99,000 vehicles per day. A steady population growth and an increase in jobs in the county has led to the increase, which is expected to rise even more.

The answer to the traffic problem is a \$65 million highway improvement project. The project widens the highway from four lanes to six with one lane and shoulder added in each direction from Los Angeles Avenue in Moorpark to Highway 101 in Thousand Oaks. California Department of Transportation (Caltrans) officials say the expansion will help handle a projected 35 percent increase in traffic over the next 25 years.

Security Paving Company, in Sun

Valley, California, was in charge of slipforming the new lanes. Security Paving needed a new machine for the project. They ultimately decided on a GOMACO four-track GP-4000 slipform paver with an In-The-Pan

The IDBI inserted 18 inch (460 mm) long, 1.5 inch (38 mm) diameter bars, spaced 12 inches (305 mm) apart.



HW-080706 D23

Dowel Bar Inserter (IDBI).

"We are responsible for paving 18 miles (29 km), nine miles (14.5 km) in each direction, on Highway 23," Mike Mattivi, Vice President of Security Paving, said. "We used our GOMACO 9500 to trim the grade. Then we brought in our GOMACO GT-6300 for our base. We had six inches (152 mm) of lean concrete base underneath our Portland Cement Concrete (PCC). Then we followed that with our GP-4000 with the IDBI."

Project restraints created some tight working conditions for the GP-4000. A barrier wall was placed along the edge of the existing roadway to separate workers from live traffic. Sometimes, there was only a 22 inch (559 mm) wide ledge, between the edge of the existing roadway and the barrier wall, for the paver's tracks to run.

“Before starting the project, I was very concerned,” Mattivi said. “We had never worked with this paver before or an IDBI, and we were working in such a small area with very little room for the tracks. After the first or second day of paving though, it was just full speed ahead. There were no problems.”

GOMACO engineered six foot

(1.8 m) leg extensions for the right and left rear legs and the right front leg to help with the clearance issue. Each leg on the four-track GP-4000 has manual pivoting mount arms which allow the legs to pivot 19.5 inches (495 mm) to the inside or outside of the straight ahead position. The pivoting feature allowed Security to place the legs in

the optimum locations for their tight-clearance requirements.

The new lane had to match the profile of the existing highway. Security operated their GP-4000 locked to grade on the right side of the paver. Stringline on the left side of the paver controlled steering and grade.

A standard California PCC mix design, with an average slump of 1.5 inches (38 mm), was used on the project. It was produced by Security’s on-site batch plant. Up to 15 trucks, each carrying a 10 cubic yard (7.6 m³) load, dumped directly on grade and kept the paver supplied with concrete.

The new lanes are 23.6 feet (7.2 m)

“It couldn’t have gone any better for us. It’s been a real eye opener for us, and as far as we’re concerned, it’s the only way to get the job done. The IDBI has saved us a lot of money, as far as inserting dowels versus men working the dowel baskets. We are just thrilled with it,” Mike Mattivi, Vice President of Security Paving, said.



HW-080708 D8

The right front track and two rear tracks on the GP-4000 paver had six foot (1.8 m) leg extensions.



HW-080707 D23

Production averaged approximately 2000 cubic yards (1529 m³) per eight hour shift under live traffic.



HW-080708 D19

Pivoting leg extensions allowed Security to place the GP-4000’s tracks in their optimum position for the project’s tight conditions.



HW-080709 D9

Security Paving’s GP-4000 four-track paver with IDBI slipforms underneath a bridge overpass on Highway 23.

wide and 11 inches (279 mm) thick. A front-mounted bar inserter on the GP-4000 was inserting a #6 deformed tie bar, 29.5 inches (750 mm) long, every 28 inches (710 mm) for the longitudinal joint. The IDBI's computer manages the timing and the spacing of these bars for accurate placement, including skipping the insertion point where the transverse joint is located.

The IDBI on the GP-4000 inserted 18 inch (460 mm) long, 1.5 inch (38 mm) diameter bars, spaced 12 inches (305 mm) apart, every 23.6 feet (7.2 m) for the transverse joint. The first bar was offset


five inches (127 mm) from the edge of the slab.

The IDBI's computer control manages all of the systems and presents the information on an easy to understand display. The computer controls the timing and operations of the IDBI functions, including sending the bar-loading trolley, positioning the IDBI in standby, and activating the IDBI system for bar insertion.

Production averaged approximately 2000 cubic yards (1529 m³) per eight hour shift.

The IDBI produced a quality pavement with bar insertion accuracy. After the first day's pour, Caltrans

wanted to test bar placement. They drilled 26 test cores to check placement and all the bars were within tolerance. None were found to be deficient in either depth or position.

"I was worried about using the IDBI, because we had heard they could be temperamental," Mattivi explained. "It couldn't have gone any better for us. It's been a real eye opener for us, and as far as we're concerned, it's the only way to get the job done. The IDBI has saved us a lot of money, as far as inserting dowels versus men working the dowel baskets. We are just thrilled with it." 



The GP-4000's right tracks had to run on the existing edge of highway and some areas were only 22 inches (559 mm) wide.

GOMACO Pavers Turn A Kansas Fort **WHITE**



Photo by Bill Davy, Burns & McDonnell OF-120810 D3

Three different contractors used their GOMACO paving equipment to slipform an ocean of concrete on different projects at Fort Riley.

Fort Riley, located in central Kansas, has been an integral part of the United States' military history. The fort goes back to 1852 when its initial purpose was to protect the pioneers and traders traveling along the Oregon to California and Santa Fe Trails. Throughout the years, its mission has changed with the developing country. Its vast history includes episodes with Lieutenant George Armstrong Custer, Wild Bill Hickock, the 10th Cavalry Regiment of Buffalo Soldiers, and most recently, the home of the 1st Infantry Division, nicknamed the Big Red One. Fort Riley has also become a pivotal base for the war on terror.

Recent expansions at the base have created a building boom at the Fort to accommodate the arrival of more troops and equipment. The expansion means more barracks, offices, maintenance facilities, hangars for helicopters, other support facilities, and an enormous amount of concrete paving.

Three contractors, using their GOMACO equipment, had a substantial amount of work at the Fort in 2008. Loch Sand and Construction Company, from Maryville, Missouri, had 330,000 square yards (275,913 m²)

of paving, which included rebuilding the Fort's runway and taxiways, aprons, and other structures. Smoky Hill L.L.C., based out of Salina, Kansas, rebuilt almost two miles (3.2 km) of roadway through a busy section of the base. The third contractor, Permanent Paving Company, from Overland Park, Kansas, slipformed 175,000 square yards (146,318 m²) of concrete for a new beddown facility and vehicle maintenance area.

Loch Sand and Construction Company –

Pieces of Fort Riley's existing runway date back to World War II, with extensions added on at different intervals. In general, though, the runway was very deteriorated and practically non-usable. A substantial portion of the project at Fort Riley included rebuilding the runway, surrounding taxiways and aprons.

One of the Corps of Engineers' requirements for the paving contractor for the project was they had to have paved an airfield project within the last three years of \$15 million or more. Burns & McDonnell, the design/build sponsor on the project, turned to Loch Sand and Construction Company.

Loch Sand has accomplished several extensive airport paving projects, including work at the Charles B. Wheeler Downtown Airport and Kansas City International Airport, both located by Kansas City, Missouri.

The long-time GOMACO owners moved their fleet of equipment and paving crews onto the project in late 2007. Harsh winter weather halted work until spring of 2008, when paving began full speed.

"Very seldom do you get a job like we had at Fort Riley where you're able to pave day after day after day, because you have such a large area and different areas to be working in," Rob Loch, Treasurer and Equipment Manager for Loch Sand, said. "We had 330,000 square yards (275,913 m²) of concrete pavement. That's a lot of area that has been turned white out there."

The list of GOMACO equipment on the project is an extensive one... two 9500 trimmers; a PS-2600 and PS-60 placer/spreader; a GP-3000, GHP-2800 and GP-2500 paver; two T/C-600 texture/cure machines; and a Spanit® Work Bridge.

The project for Loch Sand began with the removal of the Fort's existing runway. The old concrete was hauled away, crushed and recycled for other

building projects on the base. The next project was completing 160,000 cubic yards (122,329 m³) of grading. After that, 10 inches (254 mm) of base rock was laid for the new runway, taxiways, helicopter aprons and other facilities on their portion of the project.

The two 9500s were used to trim both the subbase material during the grading process, and the final rock base. One 9500 was set to trim 18 feet (5.5 m) wide while the other was trimming 16 feet (4.9 m) wide. When trimming the subbase material, the depth of the cut varied between three to four inches (76 to 102 mm). On the base rock, they trimmed a 0.5 to one inch (13 to 25 mm) depth with the excess trimmed rock being placed in the adjoining lane.

The runway was paved with their PS-2600, GP-3000, and T/C-600

GOMACO paving train. The new light aircraft and helicopter runway is 4500 feet (1372 m) long and 150 feet (45.7 m) wide. Paving passes were 25 feet (7.6 m) wide and 8.5 inches (216 mm) thick.

Loch Sand's second paving train, a PS-60, GHP-2800 and T/C-600, was used to pave the aprons and other projects at Fort Riley. The scope of their project is very impressive.

"After the runway, we started paving the taxiways," Jerry Wilson, Vice President of Field Operations for Loch Sand, said. "There were six taxiways that join the new runway to the new aprons. The helicopter fueling apron was paved next. Then we had a compass pad where the helicopters line up and align their compass to true north. Next on the list was a Red Cross emergency helicopter pad. Also, there were five new helicopter

maintenance buildings being built there and we poured the aprons for those. Our last section of work was a 40,000 square yard (33,444 m²) parking lot for a maintenance building. All total, we've poured 90,000 cubic yards (68,810 m³) of concrete."

Concrete was supplied by Loch Sand's on-site batch plant. Their concrete mix design was one they had developed in-house and used on other airport projects.

"It's a LaFarge slag cement blend with 620 pounds (281 kg) of cementing material, which includes fly ash," Wilson said. "We use local limestone with a 1.5 inch (38 mm) top size and local Kansas River sand. It's a mix design that our guys developed. It finishes very well and stands up on the edges."

Slump averaged 1.75 inches (44 mm). Concrete was delivered to the paving site by dump trucks, each carrying 10 cubic yard (7.6 m³) loads.

A concern during the paving process was slipforming over helicopter tie downs. The aprons required 270 tie down locations, each with four inserts or spots for tying down the helicopter.

"We built a rebar mesh with threaded pipes at each tie-bar location so we could preset them at the correct elevation," Wilson explained. "Each tie-bar mechanism was 0.5 inch (13 mm) lower than the surface of the apron so the snow plows don't hit them during the winter time. We'd cover those mechanisms, which are two inches (51 mm) by four inches (102 mm), with a piece of duct tape so



Photos by Kelly Krueger unless otherwise noted HW-080809 D20

Loch Sand and Construction Company

Edge specifications required no more than a 0.125 inch (3 mm) edge slump on the edge and only 0.25 inch (6 mm) out of vertical on the vertical side.



Photo courtesy of Loch Sand & Construction HW-060803 D1

Loch Sand's 90 degree edge impressed everyone on the project.

they didn't fill with concrete as we paved over them. A finisher on the Work Bridge would follow behind the paver, clean out the tie down mechanism, and finish around it."

The Army Corps of Engineers, who oversaw the project, had guidelines and specifications the new pavement had to meet. The requirements included both a smoothness and an edge slump specification.

"We can only have 0.125 inch (3 mm) edge slump on the edge and only 0.25 inch (6 mm) out of vertical on the vertical side," Wilson said. "Those are strict specifications and we had zero trouble meeting them. The GOMACO equipment built that edge even better than those specs.

"Airports have a different criteria

for smoothness than highway projects. The airport criteria was seven inches per mile (110 mm/km) for smoothness on a 2/10ths blanking band. That's pretty easy to make. Our average was 0.49 inch per mile (8 mm/km), which is 14 times smoother than the specification required."

Loch Sand gives credit for their quality pavement to both their crew and their paving equipment. Their slipform paving crew, which was almost 50 workers at the peak point of the project, has worked together for several years and are experienced at paving concrete. They also have personnel on site who know how to set up their GOMACO pavers to produce their razor sharp edges.

"We let the machine make our edge," Wilson said. "We have a very

strict regimen of adjusting our machines, the edge slump and the troweling finish of the pavers, so it's making the sharp, square edge through the machine. No matter how good our people are working behind the paver, the concrete has to come out smooth, because that's the one thing the finishers can't fix."

Loch Sand has produced a quality project for Fort Riley. All of the 330,000 square yards (275,913 m²) of paved concrete exceeded specifications and no grinding had to be done.

"Loch Sand's company motto is: There is no substitute for quality," Mike O'Riley, Loch Sand's Project Manager at Fort Riley, said. "That's what you see out here on this project and every project we do."

 continued...



HW-070816 D1

A 9500 prepares grade ahead of the GOMACO paving train.



HW-080811 D17

A T/C-600 followed the paver applying a white spray cure.



HW-080806 D19



HW-080810 D10

Smoky Hill L.L.C.

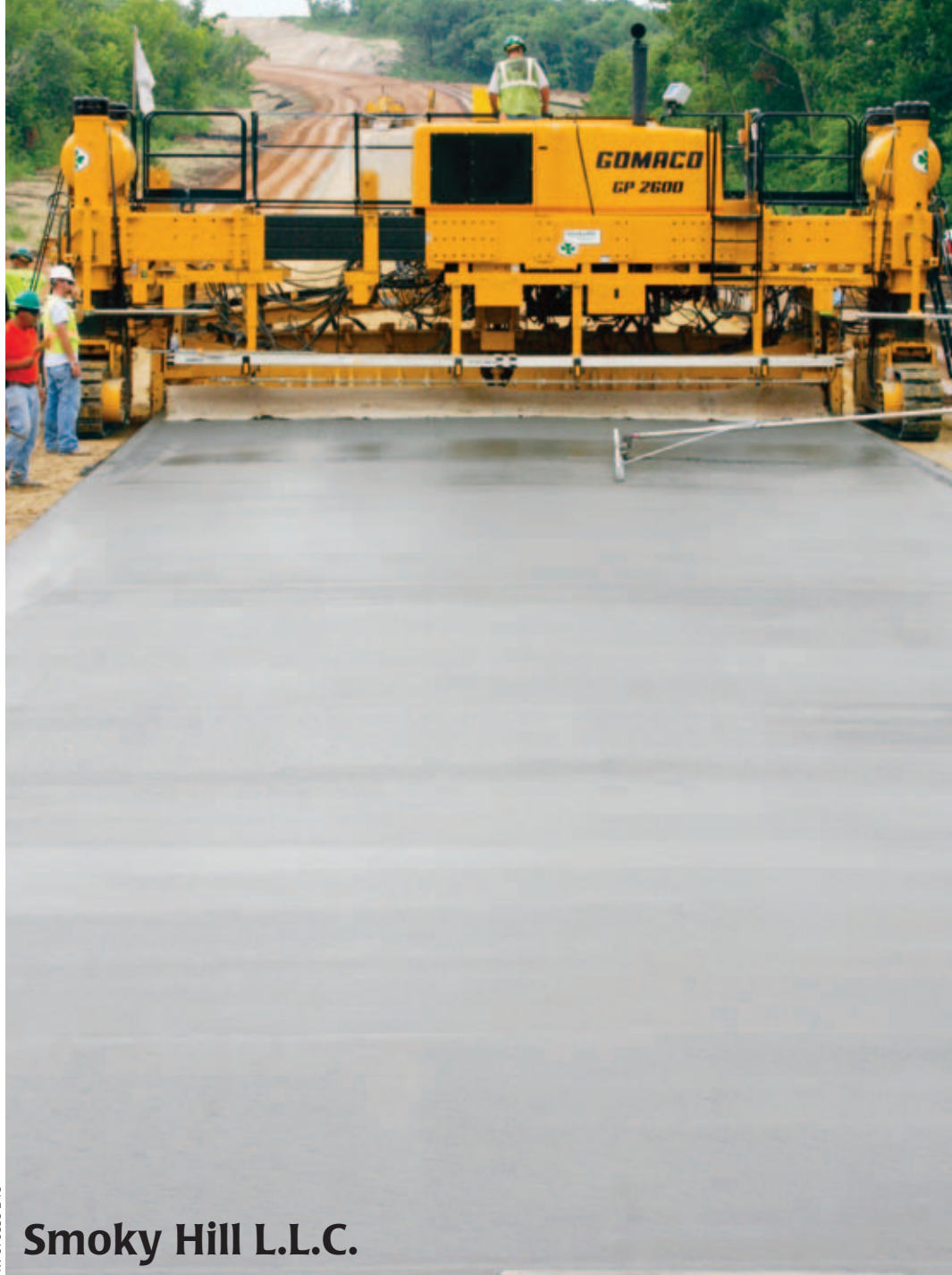
The project requirements called for the removal and replacement of almost two miles (3.2 km) of existing asphalt roadway. The section of roadway is one of the busiest thoroughfares through Fort Riley and connects the town of Ogden, Kansas, with the main barracks housing 20,000 soldiers and part of the base's company headquarters. The old roadway was quickly deteriorating. The road's bad condition, combined with steep grade and a hairpin curve, was the source of several accidents. Winter's snow and ice often caused the road to be closed down for safety purposes, but that caused congestion on other roads around the base.

Smoky Hill L.L.C. was awarded the contract to remove the dangerous road and replace it with concrete. The project involved straightening portions in the new roadway while trying to decrease the steep slope. The new road had to be built as far away as 100 feet (30.5 m) from the existing one in some places. Smoky Hill also hired a subcontractor to blast and remove 25 feet (7.6 m) through a rock cut, then used that material in a 20 feet (6.1 m) fill area. Even with that measure, they are still having to slipform a portion on a six percent grade. Superelevations and crowns in the new grade and pavement created additional challenges for them. A roundabout and tank crossings were other unique aspects of the project.

This year the family-owned company decided to add a third paving crew. In the past, they have always paved with GOMACO equipment. And once again, they chose GOMACO when they purchased a new GP-2600 two-track paver for their new paving crew.

"We do a lot of urban pavement," Garrett Cloyd, Project Superintendent for Smoky Hill, explained. "We specialize in chopped up projects and we do a lot of conveyor paving, because we have no room for a placer/spreader in a lot of areas where we work. We need a paver that is diverse and able to be changed pretty readily."

Their GP-2600 is equipped with a front-mounted conveyor system to help deal with their different projects' tight conditions. The conveyor system



HW-070888 D18

Smoky Hill L.L.C.

Smoky Hill slipformed a new roadway complete with a roundabout, six percent grade, and a tank crossing through Fort Riley with their new GP-2600 paver.

on the paver has a belt that can be extended for concrete trucks to unload on. Once the truck is empty, the belt is retracted and the truck can drive on through. The belt places the concrete onto the grade in front of the paver. The auger/strike-off moves the concrete across the width of the open-front mold on the paver. The system gives Smoky Hill a placer/spreader option without having to find the space for an extra piece of equipment on the project.

Before any concrete paving can take place, the grade has to be

properly prepared. Smoky Hill had some demanding specifications from the Army Corps of Engineers that had to be met on the two different layers of base material. They used their GOMACO 9500 to trim each layer of base to the exacting specification.

"The Corps of Engineers would inspect after every time we trimmed," Cloyd said. "They would dig down and check the depth of the lime. If we were deficient more than 0.25 inch (6 mm), there was a penalty. The same was true for the second layer of rock. Each 12 foot (3.7 m) wide trimming

pass for both layers of base material was inspected for depth accuracy.”

The Corps never found their grade to be deficient.

Stringline set on the project controlled the trimmer’s steering. Carefully setting the stringline allowed Smoky Hill to trim the grade with the same superelevations the paver would put into the concrete roadway. Topcon sonic sensors helped control the grade, which ensured an accurately trimmed base.

“This road had eight supers in it and some of them were pretty lengthy,” Cloyd said. “We also had multiple places where we went from a crown, transitioned into a super, and then went back to a crown again. We watched the stringline very closely and were pretty detailed with it to make sure the lime and the rock were where they need to be.

“We had a tank crossing that needed to be 0.5 inch (13 mm) thicker pavement than the rest of the road. We just marked that out ahead of

HW-070842 D2



The tank crossing has extra steel reinforcing and thicker concrete.

time. The trimmer operator just dialed the sonics down 0.5 inch (13 mm) when he trimmed the lime so it was a little bit deeper. We laid our rock on top of that and did the trimming in one pass. We didn’t have to go back to cut the tank crossing out. We also trimmed our aggregate shoulder as we went, so it was all one pass off the same stringline.”

When it was time to start paving on the project, Smoky Hill took on the biggest challenge first... the roundabout. They had slipformed one before with their GOMACO GP-2500

paver, but this would be their first roundabout, on the first pour of the project, with the new GP-2600.

“It was the first pour on the job and we had a lot of people watching us, from Corps of Engineer personnel to civilians,” Cloyd said. “It went very well. The roundabout had a 100 foot (30.5 m) radius and we started and stopped paving in the exact same spot. They’re big enough around that by the end of the day we just had to put burlap out and wash the paver. We left the paver there for three or four days until we got our needed cure time on the concrete. Once we got cure time, we made a ramp, tracked the paver out of there and moved it to the site of the next pour.”

With the roundabout complete, paving on the rest of the roadway started. All of the concrete pavement on the project was 24 feet (7.3 m) wide and nine inches thick. Production averaged between 110 to 120 cubic yards (84 to 92 m³) per hour. A portable batch plant was set up on-



HW-070833 D18

The GP-2600 has a front-mounted conveyor system to help with the project’s tight conditions.



HW-070842 D3

The conveyor system features a belt that can be extended for concrete placement and then retracted to allow room for the trucks to pass.



Photo by Mark Hankins HW-050805 D10

Smoky Hill’s first project with their new GP-2600 paver was slipforming a roundabout with a 100 foot (30.5 m) radius.



HW-070827 D8

Permanent Paving Inc.

One of Permanent Paving's projects is a 15 acre (6.1 ha) vehicle maintenance parking area that will eventually hold approximately 700 of the bases' HMMWVs, or High Mobility Multipurpose Wheeled Vehicles.

site to supply the concrete. The mix was a Corps of Engineers approved design with slump averaging 1.5 to 1.75 inches (38 to 44 mm).

Another interesting aspect of the project, and something not found on an ordinary road project, was the tank crossing.

"There's a tank crossing through the roadway, an intersection for the tanks to travel across while moving from their battalion headquarters on the base out onto the firing range," Cloyd said. "The Corps wanted the intersection to have a little bit thicker concrete, 0.5 inch (13 mm), and it has a little bit different steel in it for extra reinforcing."

The paver is equipped with a frame-mounted bar inserter on the front. It placed a transverse bar every 24 inches (610 mm) for the longitudinal joint. A timing wheel on one of the paver's tracks measured out the spacing of the bars automatically.

A second wheel on the track is

part of Smoky Hill's vibrator monitoring system. They are using a Minnich Auto Vibe II system, which helps them control vibrator vpm, as well as monitors and stores their vibrator data.

"It wasn't a specification on this Corps of Engineers' project, but the Kansas Department of Transportation started requiring it a few years ago," Cloyd explained. "They wanted to be able to have a readout of our vibrator frequencies and other measurements.

With this Auto Vibe II, we just take the card out, take it into the office, and we can print them out a chart showing all of our information."

The GP-2600 is putting down a lot of concrete for us and is giving us the smoothness that we're wanting," Cloyd said. "We're having no problems with our edges. They're standing up beautifully. It's putting out good concrete and we're pretty pleased with it."

continued...

HW-070825 D5



Permanent Paving's GP-2600 paved the new parking area in 24 feet (7.3 m) wide passes. Their T/C-600 applied a white spray cure.



HW-070828 D3

Permanent Paving is slipforming 90,500 square yards (75,667 m²) of concrete pavement on just the Vehicle Maintenance parking area.

Permanent Paving Inc. –

The Custer Hill Beddown Facility at Fort Riley is a design-build project including Brigade and Battalion Headquarters, Company Operations, and Tactical Vehicle Maintenance facilities totaling over 175,000 square yards (146,318 m²). The new complex will provide operational facilities for a Sustainment Brigade attached to the 1st Infantry Division.

Mortenson Construction, based out of Minneapolis, Minnesota, is the prime contractor on the project. They partnered with Permanent Paving Inc. to complete the concrete paving portion of the huge project. They are also responsible for paving a new 15 acre (6.1 ha) Vehicle Maintenance parking area at Fort Riley.

“The Custer Hill project, for us, is a series of roads, hardstand paving for parking, tank haul roads, curb and gutter and just an array of different projects,” Steve Bird, President of Permanent Paving, said. “Our second job, the Vehicle Maintenance area, is just one large lot with a little bit of curb and gutter.”

The Custer Hill Beddown Facility’s 85,000 square yards (71,069 m²) of concrete paving was broken down into five different segments.

“The beddown project was pretty challenging and required us moving our paver around to different areas within the project,” Bird said. “We brought in our Commander III four-track and paved 24 feet (7.3 m) wide, 8.5 inches (216 mm) thick with it. The Commander was nice on the project, because it’s so easy to move and transport.”

The project has 14,000 lineal feet (4267 m) of 24 inch (610 mm) wide Type B curb and gutter with a 12 inch (305 mm) back and a six inch (152 mm) face. Permanent Paving

used their GOMACO GT-3600 curb and gutter machine to slipform the profile.

The Vehicle Maintenance parking area had 90,500 square yards (75,667 m²) of concrete pavement. The company brought in their new two-track GOMACO GP-2600 paver to slipform the 360 feet (110 m) wide by 650 feet (198 m) long lot. They paved the lot in 15 paving passes, each one 24 feet (7.3 m) wide and 8.5 inches (216 mm) thick. Number five epoxy-coated tie bars were inserted into the side of slab on 30 inch (762 mm) centers.

The concrete on the project was supplied by a portable wet batch plant located close to the projects. The concrete was a 650 flex mix with an average slump of one inch (25 mm). The concrete was delivered to the pavers in specially-modified ready-mix trucks that dumped directly on grade.

“We rigged the trucks with paving mixers so each one was capable of unloading their 10 cubic yard (7.6 m³) load in approximately 60 seconds,” Bird said.

Project specifications did not have a smoothness requirement for Permanent Paving’s work at Fort Riley. They did, however, have a straight-edge requirement, allowing only a 0.25 inch (6 mm) deviation in 16 feet (4.9 m). The specification was easily met by both the Commander III and GP-2600.

“We didn’t do any grinding or



HW-070830 D18


The 650 flex concrete mix was dumped directly on the grade in front of the new GP-2600 two-track paver.



HW-070828 D10

Straight edge requirements allowed only a 0.25 inch (6 mm) deviation in 16 feet (4.9 m).

have to take any kind of corrective measures on our concrete pavement,” Bird said. “Our GOMACO pavers have worked out great for us and we’re really pleased with them. They do everything we ask and our operators really like running them.

“GOMACO has always been there for us and their service is top notch. Any company can sell a machine, but what’s important to me, even more important than pricing, is the service they provide. GOMACO always finds a way to help us out.” 

GOMACO 9500 Trimmer

The Work Horse of the Paving Operation



Photo by Dean Bengford FF020803 DS

Trimming 136 Miles (219 m) on the iROX Project

LeeMar is averaging 13,000 square yards (10,869 m²) of trimming production in a six to seven hour shift on southern Florida's iRox Project.

The iROX Road Expansion Project is making history in southwest Florida. It's the state's first design/build/finance (DBF) project creating new northbound and southbound lanes on the inside of the existing lanes on 30 miles (48.3 km) of Interstate 75. The work will all be completed in just over three years.

According to the iROX Web site, the project is extraordinary on many levels. First, its size... expanding 30 miles (48.3 km) of I-75 to six lanes. Second, the timing... it cuts five years off the timetable for a job this size. Third, its flexibility... work was begun on the project while engineers were still designing other segments.

LeeMar Building and Construction, with headquarters in Fort Myers, Florida, is part of a joint-venture team working on the first 17 miles (27.4 km) of the project. They are a subcontractor to Anderson Columbia Company Inc. Part of

LeeMar's responsibilities on the project is building the subgrade and base for the new lanes of interstate. They bid the project using scrapers and motor graders. It wasn't until after they won the bid that their GOMACO distributor, Flagler Construction Equipment, LLC, with offices in southern Florida, introduced them to the 9500 trimmer.

LeeMar knew they would want a machine that was capable of trimming a full 12 foot (3.7 m) lane in a single pass. The trimmer would need to be powerful and rugged enough to cut through two to three inches (51 to 76 mm) of hard material. The finished grade would also have to be able to pass a strict inspection process after trimming was complete. And they wanted a distributor who could offer them local support on their new machine.

"Dean Bengford with Flagler and Vinnie Miller with GOMACO came

down and met with us and were an integral part of getting us involved with the 9500," Butch Felts, Vice President of LeeMar, said. "They gave us the comfort level to move ahead with this even though we had never used one of these machines before. We have a level of trust with Flagler. They confirmed this was the machine we had to have, so here we are."

LeeMar's 9500 is equipped with a 12 foot (3.7 m) mining head. They are using it to trim the stabilized subgrade surface and then the final lime rock base.

"Our subgrade material is a 40 LBR (load-bearing ratio) plus that's a dirt and rock mix," Felts explained. "It's just a really sandy, rocky material that we're trimming. Then, the lime rock that we use for our finished base course is a true limestone that we put down, compact, and then trim. We're taking from three inches (76 mm) down to 0.25 inch (6 mm) when we

trim. We're not spending a lot of time prepping the surface. We're just getting in, compacting it, and letting the 9500 leave the finish. We're paving right behind it."

They're building the new roadway 24 feet (7.3 m) wide, which requires two trimming passes. When they trim, LeeMar tries to average one mile (1.6 km) a day production, including both lanes. That's an average of 13,000 square yards (10,869 m²) in a six to seven hour time frame. The remaining two to three hours in the day allows the inspectors time to perform their testing and give the

go-ahead for paving on the grade the next day.

The grade's inspection process is a rigorous one.

"We have density testing and verification from the state," Felts said. "Then they use a straightedge and stringline to check the tolerances of our finish. They do cores to make sure our thickness is correct. Coring is kind of a double-check, because they've already stringlined the subgrade and the lime rock. Once that is done, the grade is sprayed with a prime coat and then the pavers can have it."

LeeMar has their system worked

out so they can get their day's trimming accomplished and the inspection process completed in one day. The weather in southern Florida can be unpredictable, to say the least, with rainfall averaging over 20 inches (508 mm) per month during the summer.

Working only six feet (1.8 m) away from live traffic going 70 miles (113 km) per hour also keeps Felts' crew alert and aware of their surroundings at all times.

"Traffic is extremely busy and we actually have no barriers between us and the vehicles," Felts said. "It's the



Photo by Jim Dilling FT-030801 D1

Two trimming passes, each 12 feet (3.7 m) wide, form two new lanes of traffic making Interstate 75 six lanes wide.



Photo by Dean Bengford FT-020802 D12

The 9500's long-reaching placing belt, over 34 feet (10.6 m) long, conveys the trimmed material into an awaiting dump truck.



Photo by Jim Dilling FT-030801 D2

LeeMar used their 9500's built-in sensor arm boom to reference steering off the existing slab. Elevation was controlled with a rolling grade ski running on the trimmed grade.

way they sold this project to the state, adding on the lanes the way they are. We're trimming against the edge of the existing road and we have a six foot (1.8 m) wide area between us and the actual cars going by us. They have barrels every 100 feet (30.5 m) that just lets the cars know where they're at."

Building onto the existing interstate also created challenges. The line and level of the new lanes has to match with the existing lane. LeeMar equipped their 9500 with a rolling grade ski. On the first trimming pass, grade is taken off the existing lane. Then for the second pass, the first

trimmed pass is used as their control. The steering sensor for the 9500 runs off the edge of the existing lane for both trimming passes.

"We're using the standard steering sensor for steering and the rolling ski for elevation control," Felts explained. "Our control is whatever is existing, which does change because it's an existing highway. The rolling ski is working great for us.

"That first pass, too, we're trimming right up to the edge of the existing roadway. We have a 15.5 inch (394 mm) drop-off from the roadway down to our subgrade so GOMACO

custom-built a knife for us. The knife shaves that vertical edge perfectly and we don't have to go back and clean it up."

LeeMar's 9500 is equipped with the GOMACO G21 digital control system. They also have the optional slope transition system and Super Slope software. The features help them with automatic and smooth corrections for grade elevation.

"We had the software added to handle our superelevation turns," Felts said. "We have quite a few vertical curves and superelevations that are constantly switching so we're

Stringless Trimming Production on a Bypass Project in Arkansas

The town of Grady, Arkansas, had to be bypassed this summer when it didn't have enough room through its downtown area to accommodate the Highway 65 rebuilding project. The Arkansas Highway Department purchased new right-away land for the project and work on the new bypass began.

The new four-lane roadway, two lanes each, going northbound and southbound, was created for the project. Weaver Bailey Contractors Inc., based out of El Paso, Arkansas, was responsible for trimming the subgrade. They brought in their two GOMACO 9500 trimmers for the work.

One 9500 ran off stringline, while the other trimmed with the company's new Topcon Millimeter GPS™ 3-D machine control system.

"We thought it was time to take a step forward with the stringless

technology and see what advantages the GPS system on one of our trimmers would have for us," Jim Jolly, General Superintendent for Weaver Bailey, said. "We were very paranoid starting out with it, because we've been on string for so many years."

The 9500s are equipped with 16 foot (4.9 m) trimming heads and are cutting through a silty sand material. Five different passes were needed to accomplish the trimming for the 60 foot (18.3 m) wide subgrade.

Stringline was set on some of the trimming passes for one of the 9500s. The stringline also served as a check for the stringless system to make sure it was cutting an accurate subgrade. It was a measure taken to combat some of the company's stringless paranoia.

"We had the stringline to come back to and check grade at any given spot," Jolly said. "Plus, we had a

Topcon rover for other spot checks so we knew, without a doubt between the two methods, that we were hitting grade."

With any doubts about the system's accuracy erased, Weaver Bailey started focusing on production. The 9500 with stringless was averaging 5000 square yards (4181 m²) of trimmed material per day. The 9500 on string averaged around 3000 square yards (2508 m²).

"There's the tendency with the stringline system that the faster you go, the more vibration you pick up in your stringline and sensor wands," Jolly said. "You don't have to worry about that when you're stringless, and you can trim at a higher speed. We can probably trim one-third faster than with stringline and not have any trouble with the grade, if our subgrade out front is prepared fairly closely."

Time savings also have to be taken into consideration with the stringless system. Crews aren't needed to set up all of the stringline on the project. Jolly also mentioned time savings with the 9500 itself, getting off and on stringline for each trimming pass.

"The trimmer has to be set up and ready to run for every pass on the stringline... extend the arms out, reset the trimmer, get back on line, that sort of thing," Jolly explained. "A really experienced crew will probably spend about 30 minutes getting the trimmer ready to go again for another pass. With the stringless, you just pull off the trimmed pass, set down on the new one and go again. That's a big time savings for us."

Weaver Bailey has claimed success on their first stringless trimming project and are already looking forward to another to put their 9500 trimmers to work on.

"Our 9500s are really good machines," Jolly said. "One of them is almost 15 years with 15,000 hours on it and it's still running good. We're not afraid to work them hard and they never fail to deliver a good product."



Weaver Bailey's 9500 trims stringless with the Topcon Millimeter GPS™ 3-D machine control system.

using that feature a lot. It's really simple to do. You just enter everything into the G21, your start and stop point, the length of it, if you have to go from a plus two percent to a minus two percent, and the computer counts it all. A timing wheel measures out the distance and the controller automatically adjusts the cutterhead as the machine walks through and floats that superelevation in there. It's really a great feature.

"When we first got this machine, we were scared to death and thought it was going to be like learning rocket science to be able to operate the thing. It truly did not turn out that way. Within three hours of getting our training on it, we were hot and ready to go."

The company has two years to complete their portion of the work on the iROX expansion project. They estimate their work will be done in just over a year. They'll have trimmed 136 miles (219 km) of base material by the time the project is completed.

"This project is getting inspected to death and our tolerances have been right on. The inspectors are very pleased," Felts said. "For the guys paving the project, the grade is way beyond anything they're used to receiving and their yields are no problem for them."


"The 9500 is amazing. We bid the job not even knowing about the GOMACO, and I would say we're cutting our grade time in half because of it." 



Photo by Dean Bengford FT-020801 D14

The entire project was trimmed working only six feet (1.8 m) away from live traffic.



Photo by Ken Kelly FT-040702 D25

The 9500 with GPS system produced the same amount of finished grade as two motor graders working together did. And the 9500 produced a perfect grade in one pass, compared to the several needed for the motor graders.

Machine Controls That Pay Their Way— Contractors enthusiastically accept GPS systems.

... an excerpt from an article written by Daniel Brown, Contributing Editor for *Better Roads* magazine. The article originally appeared in the August 2008 edition.

Contractors nationwide are finding that Global Positioning Systems (GPS) pay for themselves in improved grading productivity. Put simply, GPS speeds up grading. No more stakes are needed, and the accuracy is on the money, so no material is wasted. Rework is a thing of the past because it's done right the first time.

Trimming in Texas –

To build a 6.5 mile (10.5 km) section of State Highway 45 near Austin, Texas, contractor T.J. Lambrecht Construction bought a trimmer and equipped it with a Topcon Millimeter GPS system. The GOMACO 9500 trimmer cutter is 16 feet, 8 inches (5.1 m) wide, and was being used to cut grade to within 0.25 inch (6 mm).

Was the GPS worth the money?

"The trimmer with GPS can produce the same amount of finished grade as two GPS motor graders working together," says Mike Wehling, Lambrecht's regional survey/GPS machine control manager. "The trimmer makes one pass and the grade is perfect, but with motor graders you have to make multiple passes."

Wehling says the company's first two trimmers were equipped with Topcon Millimeter GPS. The GPS is used to control steering, and the laser is used to control grade.

"At about 600 foot (183 m) intervals down the road, we set up the fan-beam laser on control points," Wehling explains. "The trimmer uses two of them, and we leapfrog them one after the other down the road. The laser transmits a fan-shaped beam to the two receivers on the trimmer, one on each side of the machine."

The Millimeter GPS system works much like a regular Topcon GPS system. Lambrecht loads three elements – a 3-D model of the design, a localization file, and a linework file – into the control box on the trimmer. The localization file fits the design to control points on the site, and the linework file controls horizontal positioning.

The GPS system cost Lambrecht about \$100,000, Wehling said. However, he points out, consider that very little surveying and no stringline are necessary. If you compare the cost of a three-man survey crew and a four-man stringline crew, you would go through \$100,000 in pretty quick order, he points out.

Good Rideability Starts with Accurate Trimming

The Interstate 64 project in St. Louis, Missouri, is unique in several aspects. It's the first design/build project in the St. Louis area and involved completely shutting down four miles (6.4 km) of interstate while it's being rebuilt. In total, eight miles (12.9 km) will be reconstructed, with the next half of the project completed in 2009.

The project is being built by a consortium called Gateway Contractors, and involves Granite Construction, Fred Weber and Millstone-Bangert. Millstone-Bangert is responsible for all of the mainline paving on the project and are using their GOMACO paving train with a four-track GHP-2800 paver.

Project smoothness specifications require a reading of under 30 on the zero-blanking band. Millstone-Bangert is consistently running between 10 and 12. Smoothness, according to Ron Dibler, Millstone-Bangert's Paving Superintendent, begins with the base.

"Good ride is a process that begins from the ground up," Dibler said. "You have to have good string, consistent



FT-100801 D14

Millstone-Bangert uses their 9500 with the Leica system to trim grade on I-64.

mix and try to keep the paver moving with minimum stops. Most important though, is a good solid trimmed base to pave on and run the paver's tracks."

The grade for the I-64 project consists of 10 inches (254 mm) of six inch (152 mm) minus rock, capped with two inches (51 mm) of Type 5 rock. The top layer is trimmed to final, accurate grade with a GOMACO 9500 with an 18 foot (5.5 m) trimming head.

On the first phase of the project, they have trimmed five miles (8 km) of

100 feet (30.5 m) wide mainline plus extra room for the track line. Each lane of highway is 25 feet (7.6 m) wide, so two passes created a 36 feet (11 m) wide trimmed area for pavement and trackline.

Millstone-Bangert uses the Leica system on their 9500 to eliminate the need for stringline.

"We have in-house surveyors who make our Leica project models and set our paving hubs," Dibler said. "We've been running the system for four years now and we love it. We run two total stations on our trimming work and we keep them within 500 feet (152 m) of the trimmer. We'll set them up in the middle of a 1000 foot (305 m) trimming pass and use that total station for multiple passes."

Production averages 15 to 16 feet (4.6 to 4.9 m) per minute when trimming through two inches (51 mm) of material.


"Our Leica equipment is very accurate, user-friendly and great to operate," Dibler said. "It helps us build a base that's our first step in achieving smooth ride numbers." 



Photo by Kelly Krueger FT-100802 D5

Two total stations are used on the project, one controls the 9500 trimmer while the other one is used for grade accuracy checks.

Superb Production on Indiana's SUPER 70 Project



GOMACO pavers slipformed 564,000 square yards (471,560 m²) of mainline paving on Indiana's Super 70 project by Indianapolis.

All of the concrete pavement on the project was 16 inches (406 mm) thick.

Indiana's Interstate 70, from the east side of Indianapolis to the north split with Interstate 65 (downtown Indianapolis) and the east leg of Interstate 465, is one of the state's most heavily traveled roads. It carries nearly 180,000 vehicles daily through the six mile (9.7 km) stretch.

The interstate was originally built in the early 1970s and has never been rebuilt. The heavy traffic volumes were taking their toll on it. The pavement and bridges were deteriorating. Its old design also had inside shoulders that were only seven feet (2.1 m) wide and too narrow, curves that were difficult for motorists to see around, and low vertical clearance on several of the bridges.

The Indiana Department of Transportation's (INDOT) solution for

I-70 became the Super 70 project. The \$175 million project would create 75 lane miles (121 km) of new pavement, including the travel lanes and new inside and outside shoulders. Twenty-eight bridge structures would also be rebuilt along the route. In total, 262,000 cubic yards (200,314 m³) of concrete, 665,000 tons of stone and 10,090,760 pounds (4,577,169 kg) of steel would be used on the project. And INDOT wanted the project basically completed in one paving season. The penalty for missing the deadline would cost \$120,000 per day.

The project had to be completed without shutting down any more lanes of interstate than was absolutely necessary to help traffic flow in and out of Indianapolis. Three lanes of traffic had to be open into downtown and two

going out during morning rush hour. It was reversed during the evening rush hour. A moveable barrier system helped open and close the lanes.

E&B Paving, based out of Anderson, Indiana, was in charge of paving the approximately 564,000 square yards (471,560 m²) of mainline paving on the project. They used not one, but two GOMACO paving trains on the project... two PS-2600 placer/spreaders, two GHP-2800 two-track pavers, and two T/C-600 texture/cure machines. They also had three GOMACO Commander IIIs on site paving the shoulders and ramps with a GOMACO RTP-500 rubber-track placer feeding the concrete. A GOMACO 9500 trimmed the final grade.

"We knew going into this project that we had to be able to pave every day



Two different paving trains were at work on the interstate to help ensure E&B met the project's tight deadline.

A GOMACO T/C-600 texture/cure machine applied a transverse tine and white spray cure.

if we were going to beat the deadline,” Mike Korba, Concrete Paving Superintendent and Project Manager for E&B Paving, said. “We took the project’s two jobs, combined them, and then divided that up into six segments. We placed one GOMACO paving train on the east end of the project and put another paving train on the west end. If we were waiting on a bridge or some other reason why we couldn’t pour on one end, we’d just jump down to the other end. We always had to have a Plan B.

“We also spent a lot of time with the GOMACO 9500 trimming the grade. It ensured that our grade was correct and the track line for our paver was smooth. We’re adamant about double-checking our trimmed grade, especially with that many bridges on the project. We’re very proud of the fact that we only had a 5.6 percent average concrete overrun on the project.”

E&B had their new portable batch plant with horizontal drum on site. It had the production capabilities of feeding both paving trains, if needed. Seventeen to 19 trucks, each hauling 10 cubic yard (7.6 m³) loads of concrete, were needed to keep the paving train supplied on the farthest ends of the project. They would often times get caught up in I-70’s heavy traffic. Because of that reason, they tried to maintain their concrete slump around 2.25 to 2.5 inches (57 to 64 mm).

All of the pavement on the project was slipformed 16 inches (406 mm) thick. The two-track GHP-2800s paved three passes, 24 feet (7.3 m) wide, to complete the new six lanes of interstate. Baskets with 1.5 inch (38 mm) dowel bars were placed on grade every 18 feet (5.5 m). A #7 bar was manually inserted every 36 inches (914 mm) on both sides

of the new roadway.

T/C-600 texture/cure machines followed behind the pavers and applied a burlap drag finish, transverse tine and white spray cure.

The three Commander III four-tracks on the project were busy paving shoulders, zero-clearance shoulders with a side-mounted paving package, and outside shoulders and variable-width ramps with a V2 mold.

The 14 foot (4.3 m) wide zero-clearance shoulder was slipformed up against a new retaining wall separating the job site from live traffic while scabbing onto the new roadway. Project phasing dictated the wall placement first and then the shoulder, so E&B’s equipment had to be able to accommodate the requirement.

The most effective way for them to pave the shoulder was to side-mount their 14 foot (4.3 m) mold. The 12 foot (3.7 m) paving mold was kept mounted underneath the Commander III so they didn’t have to switch out molds for the two different applications.

An RTP-500 placed concrete from the dump trucks on the grade in front of the Commander III. Baskets on the grade were placed at 18 foot (5.5 m) intervals.

“The extra reach from the RTP-500’s 35 foot (10.7 m) placing conveyor saved us a lot of headaches and overall, the placer gave us the production we needed,” Korba said.


The RTP-500 also worked in front of the Commander III equipped with a V2 hydraulically-adjustable dual mold system.

“We had several visitors on our job site at different times and they were all impressed with our V2 and the way we made our width changes on-the-go,” Korba said. “We slipformed 12 feet

(3.7 m) and then widened out to 18 feet (5.5 m) on-the-go. Then we would go from the 18 feet (5.5 m) back in to 12 feet (3.7 m). It’s pretty impressive to be able to make those kind of width changes on-the-go.”

E&B completed their portion of the Super 70 project in just 130 paving days. Seventeen of those days had both paving trains at work on both ends of the project. Sixty-five days were spent paving the west portion of the project with approximately 250,000 square yards (209,025 m²) of concrete. Another 65 days was spent on the east project’s 314,000 square yards (262,535 m²) of pavement. That’s an average of 4338 square yards (3627 m²) of concrete pavement slipformed on a daily basis.

“I can’t say enough good things about the GOMACO equipment and how happy I am with it,” Korba said. “We have a great crew, too. A lot of them are seasoned employees who have been with us for several years and that helps a great deal.

“It’s all about teamwork. The people at GOMACO work with us and we know we can count on them to stand behind us. The personalities of everyone on this job meshed, too. Everybody was on board and respected each other’s needs. That is very important. You’re just better off having everybody on your team.” 

Editor’s Note: E&B Paving’s work on the Super 70 project has earned the company national recognition and the highest award in the industry. They were named the 2008 Gold Winner for the Divided Highway-Urban category of the American Concrete Pavement Association’s 19th Annual National Awards in Concrete Pavement. Congratulations to everyone at E&B for such a great accomplishment!



An RTP-500 placed concrete on the grade over baskets in front of the Commander III’s side-mounted mold.



The company kept their 12 foot (3.7 m) paving package mounted underneath the Commander III while they paved with their side-mounted 14 foot (4.3 m) zero-clearance mold.

Paving 1,000,000 Meters (3,280,840 ft) with Commander III's in the UK –



Photo by Kent Godbersen CG-100802 D4

Peter Davidson has accomplished something unheard of for slipform paving in the United Kingdom. This year he hit the 1,000,000 linear meter (3,280,840 ft) mark for concrete slipforming. And he paved it all with GOMACO equipment, specifically, the Commander III.

"It's just a very versatile machine," Davidson said. "We've got a great relationship with GOMACO and we're all on board together. I've never had an application that GOMACO hasn't already done before and they offer us help and support every time."

Davidson started out in the concrete business in 1981. He purchased his first Commander III in 1994, and has owned nothing else since.

The paving milestone was reached on the M1 Motorway near London, between Junctions 6A and 10. Davidson has the contract to slipform 32 kilometers (20 mi) of 900 millimeter (35.4 in) tall European step barrier, 28 kilometers (17.4 mi) of v-channel, and 3000 meters (9843 ft) of slot drain. Kent Godbersen, GOMACO's Vice President of Worldwide Sales and Marketing, Rory Keogh, GOMACO International Ltd.'s Managing Director, and Randy Bean, GOMACO's International Sales Coordinator, joined Davidson on the project as the million mark was hit.

Modifications to Davidson's four-track Commander III has given his company the versatility of a right-side or left-side slipforming machine.



Photo by Barry Harber CG-100809 D9

The mold can be hydraulically telescoped up to 300 millimeters (11.8 in) for easy positioning and setup.



Photo by Andy Linham CG-110817 D5

Vibrators are mounted through the front of Davidson's barrier mold. He feels the vibrators' location gives him a smoother end product.

“Peter is not only a long-time customer of ours, but also a true friend of GOMACO,” Godbersen said. “It’s been fun watching him take on all of the challenging projects that he has, and it was an honor to be a witness to his paving milestone. It is always interesting to see what unique projects Peter will come up with next.”

Davidson’s Commander III on the project is as unique as the accomplishment. It has several features on it to fit the company’s demand for accomplishing challenging projects.

It’s a four-track machine with the capability of either right-side or left-side slipforming. GOMACO engineers basically took the standard Commander III framework and rotated it 180 degrees underneath the prime mover. The hydraulics normally used for telescoping the four-track frame are now used to position the conveyor. The conveyor can be positioned by the operator for right-hand or left-hand pours by simply pushing a button from the operator’s platform.

His Commander III features a hydraulically folding conveyor. It’s a standard 610 millimeter (24 in) wide, six meter (20 ft) long conveyor, with a 1.7 meter (5.5 ft) folding section. Again, the operator can accomplish the task simply by pushing a button from the operator’s platform. The folding conveyor cuts down on the overall length of the machine and makes loading and transporting the machine easier.

Davidson’s machine also has



Kent Godbersen (left), from GOMACO, was on-site when Peter Davidson (right) hit the 1,000,000 linear meter (3,280,840 ft) mark with his four-track Commander III.

300 millimeters (11.8 in) of offset built into the mold’s mounting beams. He can position the Commander III’s tracks on the roadway and hydraulically offset the mold in or out for correct placement.


“It’s a great feature,” Davidson said. “Sometimes the people who are preparing our grade and saw cutting the existing roadway get it grossly wrong. Before, we’d either have to come in and back fill or run our tracks down in the hole. Now, we just position the machine on the roadway, hydraulically move the mold out, and set the machine up.”

Davidson’s Commander III has GOMACO’s G22 control system. The

G22’s new graphical display provides the operator with an easy to understand interface to the machine’s controls. Newly designed icons and screens with pictograms reduce the operator’s learning curve to a minimum. The brightly colored graphics and full text explanations provide a user-friendly operator experience. The G22 has a dual-language feature with the ability to operate in English or a second language.

“The clarity of the G22 is really nice,” Davidson said. “It makes moving the machine easier and the setup time quicker.”

There are currently three Commander IIIs in Davidson’s inventory and he keeps all of them busy on projects throughout Europe. On this barrier project, his crews slipformed 17 kilometers (10.6 mi) of wall in 25 working days. Crews worked 24 hours a day, six days a week on the project, barely letting the engine oil on the Commander III cool down.

“Usually on an ordinary day shift we can average 300 lineal meters (984 ft) of wall,” Davidson said. “If we go 24 hours nonstop, we’ll average around 700 lineal meters (2297 ft). I wanted to hit one kilometer (0.6 mi) of production in a day’s time, but we haven’t done that... yet.” 

“Peter is not only a long-time customer of ours, but also a true friend of GOMACO,” Godbersen said. “It’s been fun watching him take on all of the challenging projects that he has, and it was an honor to be a witness to his paving milestone. It is always interesting to see what unique projects Peter will come up with next.”



The Commander III’s hydraulically folding conveyor is positioned for slipforming right-side slot drain on the M1.



The slot drain’s profile features a square-shaped design which is unique from the standard round profile found in the UK.



GOMACO University's 2009 Class Schedule

GT-3200: January 6-8 at the Paving Center. (Class begins on Tuesday) Three-day course covering Network controls, setup and operation, maintenance and advanced diagnostics.

GT-3400: March 17-19 at the Paving Center. (Class begins on Tuesday) Three-day course covering G21 controls, setup and operation, maintenance and advanced diagnostics.

GT-3600: January 5-8, January 12-15, January 19-22, March 9-12, March 16-19, March 23-26, March 30-April 2 at the University. A four-day course covering G21 and Network controls, setup and operation, maintenance and advanced diagnostics.

Three-Track GT-6300: March 23-26, March 30-April 2 at the Paving Center. A four-day course covering controls, setup and operation, maintenance and advanced diagnostics.

Three-Track Commander III: February 16-19, February 23-26, March 2-5 at the University. A four-day

course covering G21 controls, setup and operation, maintenance and advanced diagnostics of the three-track machine.

Four-Track Commander III & GT-6300: January 26-29, February 2-5, February 9-12 at the University. A four-day course covering G21 and Network controls, setup and operation, maintenance and advanced diagnostics.

Trimmers: January 13-15, January 20-22 at the Paving Center. (Class begins on Tuesday) Three-day course covering the setup and operation of the 9000 and the 9500 for trimming and concrete placing operations. Sessions on machine maintenance and diagnostics will also be covered.

Two-Track and Four-Track Pavers: February 9-12, February 16-19, February 23-26, March 2-5 at the Paving Center. A four-day course covering G21 and Network controls, setup and operation, paving to profilograph specifications, maintenance and advanced diagnostics. Primary emphasis will be placed on the GP-2600, GHP-2800 and GP-4000.

For further information, please contact: GOMACO Training Department, GOMACO Corporation, PO Box 151, Ida Grove, IA, 51445-0151 or Phone: 800-831-2320 or 712-364-3347, or e-mail: gomacou@gomaco.com. Students can also register for classes online or print out forms at <http://www.gomaco.com/university>.



WORLD OF CONCRETE® February 3-6, 2009, in Las Vegas, Nevada

A Passion for Innovation and Dedication to Your Paving Needs...

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GOMACO will be in our same World of Concrete location, Booth #C5168 in the Central Hall of the Las Vegas Convention Center.



CL-050802 D8

Lambert & Grenier finish a bridge deck 225 feet (68.6 m) long, 44.5 feet (13.6 m) wide with their new GOMACO C-450 in Victoriaville, Quebec, Canada.



CG-070830 D7

Nuove Strade Srl use their GT-3600 to slipform a unique profile for electric cables and pipes along what will be a new railway connecting Bologna to Verona, Italy.



HW-100805 D4

Coco Paving is slipforming a new section of Highway 401 with their four-track GHP-2800 paver equipped with an In-The-Pan-Dowel Bar Inserter (IDBI) near Windsor, Ontario, Canada.



SH-090809 D7

Ashtrom International Limited used a Russian Antonov to fly their GP-4000 to a paving project in the country of Georgia.



CG-120803 D3

Heijmans Infras slipforms curb and gutter with their new GT-3600 on a project in Sint-Niklaas, Belgium.



CG-110806 D2

TSBV use their four-track Commander III with V2 mold on a parking lot in Soumagne, Belgium. Paving passes were five meters (16.4 ft) wide, 250 millimeters (9.8 in) thick.



Photos by Katsumi Yoshida CG-100723 D11



**GHP-2800
First Lift**

Kajima's GHP-2800 placed the first lift of concrete, which was approximately 187 millimeters (7.4 in) thick.

A GHP-2800 and Commander III four-track slipform inside one of two tunnel projects on the High Standard Highway in the country of Japan.

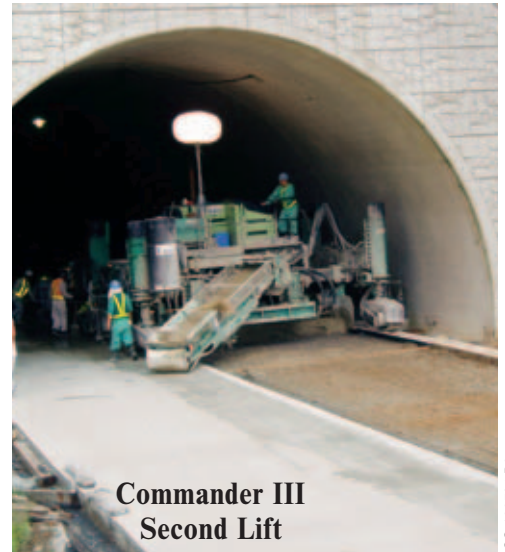
The Ayabe-Yokotani Tunnel Project

Kajima Road Company Ltd., in cooperation with K-Con Company Ltd., slipformed the roadway through two tunnels on a project in Japan. The Kyoto Traverse Tanba-Ayabe Road Yokotani Tunnel Paving Project is part of the new 100 kilometer (62 mi) High Standard Highway connecting Kyoto City with Futtsu City in Japan.

Kajima and K-Con brought in their GOMACO paving equipment to slipform the new roadway through the tunnels. Requirements called for wire mesh for reinforcement, which was accomplished in the two-lift paving process. Kajima's four-track GHP-2800 paver placed the first lift of concrete, while K-Con's four-track Commander III placed the second lift.

Concrete was placed directly on grade in front of the GHP-2800. Workers then placed 2.1 meter (7 ft) by 4.2 meter (13.8 ft) pieces of wire mesh on top of the first lift. The four-track Commander III, with placing conveyor, followed behind. The total thickness of the new roadway was 280 millimeters (11 in), with the first lift 187 millimeters (7.4 in) thick, or two-thirds of the total depth of the slab.

The width of the paving lanes varied between 4.4 and 4.6 meters (14.4 and 15.1 ft), depending on project specifications.



**Commander III
Second Lift**

After workers placed wire mesh on top of the first lift, K-Con's Commander III slipformed the second lift, which was the final surface of the new roadway.

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