



## Buffalo Airport Gets a Lift

Bringing the right technology

PAVING

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*Bringing the right technology,  
— a roadtec RP-190e with carlsson EZR2 rear mount screed,  
together with the right support network results in successful  
execution of new multi-lift airport runway.*

The Buffalo Niagara International Airport for the City of Buffalo, NY is not getting just a lift, but actually many lifts of new asphalt on parts of Runway 14-32, other than a new surface course for the entire 5,412 foot by 150-foot runway. More than 48,800 tons of P-401 surface-course with polymer modified asphalt binder, P-401 course standard grade asphalt binder, and P-403 Bituminous leveling course asphalt would be required for the 120-day contract to improve and rehabilitate the second runway. Taxiways and new drainage will also be improved.

Union Concrete and Construction Corp. of West Seneca, NY was awarded the contract that started in mid-April of 2017. They also got a lift from a group of manufacturers and companies who tirelessly worked together to accomplish the contractor's goal of strict tolerance requirements needed for a smooth runway for the Niagara Frontier Transportation Authority (NFTA). The airport represents a gateway to western New York State and portions of southeastern Ontario, Canada, which encompasses the famed Niagara Falls tourist destination. The Authority prides itself on delivering optimal standards of performance in relations to delivering high quality customer service and satisfaction to the millions of visitors and residents alike.

It is with that same concept that Union Concrete and Construction Corp., with a history dating back to 1950 by George Hill as founder, would deliver a smooth surface for the thousands of airplanes that will land at the airport. The firm worked at other airports, but this was the first runway contract in recent history.

### PLAN NOTES:

Surface Course Mat Density: 96.3 percent

Base Course Mat Density: 95.5 percent

Joint Density: 93.3 percent



Union Concrete and Construction Corp. crews use a Roadtec RP-190e paver with a Carlsson EZR2 Rear Mount Screed to successfully execute a 26-foot-wide asphalt mat.



The key to success on this project was to keep the paver moving for the entire length of each mat placed.

### SERVICE, SERVICE, SERVICE

As with anything new, pre-planning interaction with people you feel you can trust, and leveraging the latest equipment and knowledge are the powerful tools to reach any goals. But it is service, service, service that smooths and accomplishes those very goals.

So, Union Concrete employees went to the most recent ConExpo in Las Vegas to determine the tools by looking at the specific equipment needed, establishing contacts that would service the equipment properly and help them (preferably on site) to reach the company's goals. It may take a village to raise a child, but it takes an industry willing to improve its future for the good of others to progress successfully into that future. With all the equipment in mind close at hand and knowledgeable people present to confirm questions and pertinent information, objectives were accomplished quickly.

In this case, Tracey Road Equipment, the company's local paving specialist dealer, would bring out their Roadtec RP-190e paver with a Carlsson EZR2 rear mount screed. The Roadtec paver came equipped with a MOBA-matic II grade and slope automation already installed. Then the dealer contacted SITECH Solutions, a liaison and software company with affiliation to Trimble with positioning technology to 3D capabilities.

The very important service and more service aspect of the equation began on site, once the equipment was delivered. Tracey Road's service technician, John Messbauer, supported several service technicians from Carlson Paving Products who came from across the country to properly connect the 26 foot wide paving screed.

Strategic project manager, Anant Patel, with MOBA, fine-tuned the 3D leveling and quality control systems for the paver which is compatible with the Trimble 3D PSC900 Paving Control System. SITECH Northeast helped install the components required to upgrade to 3D, along with integrating a smooth flow from hardware and software design to the Trimble Universal Total Station setup.

Over several days of installation, and actual hands-on practice paving the required test strips with Union Concrete crews that would use the equipment, rehabilitation commenced. Roadtec would again service the contractor by bringing Dale Bloodgood, regional service technician to overlook and tweak anything needed while paving up to 26-foot-wide passes during the surface course paving.

#### PROJECT REQUIRED MULTIPLE LIFTS

According to paving foreman Jim Stayer, the project had multiple lifts in certain areas and in other areas there was only one mill and fill surface course required three inches deep. It depended upon how deteriorated the existing blacktop was or how much of a profile change was needed. That also designated how long the passes were. Some were as much as 2,000 to 3,000 feet long. Other areas, like the taxiways, were much shorter and more sections or phases could be done in the course of their normal 12-hour days.



The paving crew relied on SITECH Solutions, a liaison and software company with affiliation to Trimble for 3D positioning technology.



The Roadtec paver came equipped with a MOBA-matic II grade and slope automation (photo at left). Asphalt transfer machines were used to keep the wide screed supplied with ample material.

"Mostly the sections had good phase lines where it made sense to phase to and then switch to another phase since the paving was done in sections. Sixteen hundred feet had to be completely rehabilitated to subbase on one end of the runway before intersecting with Runway 5/23. It would be four feet deep, which included rubblization of 27,000 square yards, full depth construction and repairs and full depth HMA pavement construction at the long runway stretch. Full depth blacktop included eight inches of base course done in two lifts using 16,200 tons of P-401 HMA and four compacted inches of surface course done in two lifts of two inches each," Stayer continues.

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FROM PAVING DURING THE  
WHOLE PASS.**

—Jim Stayer, paving foreman, Union Concrete and Construction

"For 400 feet, there was a transition from full depth rehabilitation to just a surface course. It was a profile change because you came from nothing up to four feet of profile change, all 150 feet wide. We had no problem, and used the 3D System with our Roadtec paver and Carlson screed laying 18 ½ foot wide passes throughout the base courses and first surface course. The RP-190e paver was always our primary laydown machine, but we had our older paver making passes on the outside lanes using a string line where it wouldn't be damaged from equipment. At least seventy-five percent of our paving was done with the Roadtec paver and the Trimble 3D system," Stayer explains.

#### PAVING PROCEDURES

Paving was done in tandem, using both pavers wherever possible, to prevent cold joints. Longitudinal joints could not be exposed for more than four hours, or before the asphalt temperature cooled to less than 175° F, otherwise they would have to be cut back three to six inches for a clean, uniform cut before paving against it.

The answer to that issue was to never stop the pavers from paving a pass during their designated phases - no matter how long the pass! Some passes were as long as 3,000 feet. Having done their homework, Stayer says, "We tried not to stop the machine at all from paving during the whole pass, including when going over 30-inch-wide raised concrete/light bars that had to be covered before paving. That meant the paver was traveling about 10 to 12 feet a minute non-stop, with mobile transfer machines supplying the pavers. A round of trucks would be 600 to 650 tons of asphalt from the nearby plant. The plant has the capacity of 300-tons an hour, but with 1200 tons of asphalt in silos before actual paving, there was no shortage of asphalt coming to the pavers before the end of the day. When we did the surface course, we were putting down 3,700 to 4,000 tons a day of the P-401 surface course, while paving 25 feet wide for much of the 31,200 tons needed," Stayer continues.

A variety of rollers were used behind both pavers. The older paver used the string line on one side for grade and slope while working off the asphalt laid down by the Roadtec in front of it for the other side. That paver was not Trimble/SITECH compatible. The rollers made sure to compact the joints as one complete lift.

#### EQUIPMENT CONFIGURATIONS

According to Roadtec's Bloodgood, the Roadtec RP-190e paver was used for several features. It has a 13-inch high conveyer opening for excellent throughput with independent drive. The space between the conveyers has been minimized which allows mix to be conveyed out as one uniform flow, greatly reducing segregation. The machine is also user-friendly for personnel not familiar with the machine, very important for this occasion since the operator and others would be using the RP-190e paver for the first time on this project.

The Carlson EZR2 rear mount screed was used for weight and its four-inch chrome rods tightly fixed to a heavy-duty tubular frame, providing the extensions with optimal rigidity and eliminating independent movement of the chrome rods. Large adjustable slide blocks and bushings eliminate flexing at wider widths, especially important for laying the surface course up to 26-foot wide. A two and three-foot screed section was bolted and leveled on each side, with three 2-foot strike offs affixed, also added on each side. Six-foot auger extensions were attached to make sure the asphalt material went to the end of the screed. The pre-strike offs made sure a nice head of material was kept all the way across. Screed vibration for additional compaction throughout was maintained during all paving.



A ready supply of trucks in the distance was crucial to maintaining a continuous, non-stop paving process. Some passes were as long as 3,000 feet.

The MOBA-matic II is a flexible leveling system for pavers to control the layer thickness and the slope of the screed, in this case for a 1 percent slope across the entire 150-foot-wide runway, with an ultrasonic sensor. It's also user-friendly with four main buttons for important functions as well as for the height and slope of the paver screed. Again, it was Trimble compatible.

"Our tolerances were very tight. We have a quarter of an inch in tolerance for straightness and half an inch tolerance for elevation, across the board! We went with the SITECH system because we didn't want to put up a lot of string lines that could be damaged with moving equipment across the 150-foot-wide runway," Stayer notes. "Trimble is compatible with SITECH and has an accuracy of a millimeter.

There is no other product on the market today that is approved by the airport. Morning measurements had us running .0004 of an inch accurate, and even better other mornings.

"There are at least five guns or total stations that are read to about 400 feet. As we pave, we get a reading from the first station and when we get close to the outer 400-foot range, I switch to the next gun (total station) while still paving. The measurements are sent to the target that is mounted on the paver. In this case, to not interfere with trucks or equipment in range, we have set it 14 feet high to receive the information without interference. When the Trimble system is set up, it knows where it's at and the paver knows what the screed height is. It controls the screed elevation through the guns that are placed alongside of the runway. The total station signals basically give us a finished grade and the automation on track," emphasizes Stayer.

The Trimble 3D Paving PCS900 Control System included the Universal Total Station on-site with the mast mounted target on the tow arm of the paver with a Trimble MT900 prism on top and a slope sensor. A Trimble CB460 control box displays the 3D design model and the position of the screed. There are also design files stored in the box on the paver for guidance. Through radio commands, the grade and slope could be used to move the tow arms for the screed to adjust accordingly.

**OUR TOLERANCES WERE VERY TIGHT. WE HAVE A QUARTER OF AN INCH IN TOLERANCE FOR STRAIGHTNESS AND HALF AN INCH TOLERANCE FOR ELEVATION, ACROSS THE BOARD!**

—Jim Stayer, paving foreman, Union Concrete

### IT'S ALL ABOUT THE RESULTS

The project was done on time and with no discernable issues. "We wanted to go with the stringless system, for economy and expediency. We wanted to go with the SITECH system and then went with the other equipment compatible with it," Stayer explains. "We have had very good support from Roadtec, other equipment manufacturers and Tracy Road Equipment. There was a learning curve for us all on the whole system used, but once we figured it out, everything was very accurate. The paver and screed were also very user friendly and with the 3D system worked out very well."

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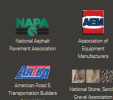
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