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Commentary

Congestion relief?

In some growing urban areas, “traffic jams I have been caught in” ranks with the price of fuel as a conversation topic and traffic congestion is described as “normal slowdown” in traffic reports. So can enough roads ever be built in these areas to eliminate congestion? Presumably the day could arrive, at least in theory, when road capacity matches peak traffic demand and no additional road construction is required. Without further growth in demand, the roadbuilding industry in these areas would then be reduced to road repair and reconstruction.

The principal contributor to traffic congestion is the single occupant private vehicle and most of us need look no further than the mirror to establish the identity of such road users. As the total number of vehicle trips continues to increase, one would expect commuters, especially in congested cities, to find ways of reducing their trip count and indeed some are. Where switching to public transit is not an option, light green measures such as carpooling, employer incentives and high occupancy travel lanes are enjoying some success and may also help to lower driver blood pressure at the gas pumps. Full or partial telecommuting, also known by its more prosaic name of working at home, can offer a number of advantages while a few take the more radical step and move close to their place of work. On the other side of the equation however, powerful forces are getting us into our cars each day for the long solo drive.

For many, commuting is the accepted price of meeting career and lifestyle goals. In any case, only a fortunate few control when and where they work. Practical necessities such as money aside, going to work can also be rewarding in terms of personal identity, achievement and social interaction. Driving alone to work also provides some personal space in a crowded day, although few going to work can also be rewarding in terms of personal identity, achievement and social interaction. Driving alone to work also provides some personal space in a crowded day, although few

Despite all the grumbling about congestion, the ongoing demand for new and bigger roads seems assured – we just want our single occupant private vehicles too much.

Andy Bateman, Editor

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Cover Photo
A Terex PR-800-7 cold planer leads the way on a Burlington Skyway resurfacing project.

Cover photo by Andy Bateman
Industry News

**B.C. road upgrades**

British Columbia has announced plans to invest $43.9 million in transportation improvements for the Fort St. John and North Peace region this year.

Work taking place includes a $9 million project to complete paving and replace a bridge on Upper Halfway Rd.

Other projects include: paving on Airport Rd, Baldonnel Rd., Road 255, Montney Highway and South Montney Coulee; paving of the West Bypass Rd. in Fort St. John; completion of the Cache Creek Bridge replacement project; completion of paving on 85th Ave. in Fort St. John; additional graveling, ditching and brushing on North Peace roads, and completion of four-laning from Road 269 to Road 271 in Fort St. John.

Another major upgrading project is the construction of a truck-climbing lane on Highway 97 at Mile 6, north of Dawson Creek. Mile 6 was selected for upgrading because it’s the first significant uphill grade between Dawson Creek and Fort St. John. The $3 million project will also consist of intersection improvements, turning lanes and overhead lighting. There will also be widening and paving of the Reiddell Sub 308 Frontage Rd.

The Mile 6 passing lane is being carried out as part of a $36 million provincial investment in the South Peace district this year. Key projects include resurfacing 31 km of Highway 52S between the elk pit and Tumbler Ridge, regraveling and seal coating about 10 km of the Old Alaska Highway, near Taylor, widening/strengthening and paving about 15 km on the Boundary Rd. south of Dawson Creek and seal coating the northern 28 km of Highway 52N between Highway 97 and Brassey Creek.

**Ontario plans major repairs for Highway 427**

A $21.9 million contract has been awarded by the Ontario Ministry of Transportation to Brennan Paving & Construction Ltd., of Markham, to repair the northbound express lanes, ten bridges and retaining walls on Highway 427 in the Toronto region. This is the third of five projects worth $127 million that is being spent to upgrade Highway 427 which is used by more than 300,000 motorists daily.

Pre-cast concrete slabs will be used to complete some of the road repairs. According to the provincial transportation ministry, this construction technique has lasting benefits and should result in more durable and longer lasting repairs. Construction work will be done with extended nightly lane closures. Contract completion is scheduled for 2010.

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**Volvo press conference draws global group**

Nearly one hundred media representatives from twenty-four countries attended the Volvo International Press Conference held in Eskiltuna, Sweden from June 4-8, 2008.

In a presentation to conference attendees, Volvo Construction Equipment president and chief executive Tony Helsham noted that oil price increases are putting pressure on product prices, with some predicting oil prices of $200 /barrel within the next two years. For manufacturers such as Volvo, increases in the price of steel are also putting pressure on product prices. Steel was some $400 /tonne at the beginning of 2004 and is now forecasted to remain at or above $1000/tonne into early 2009.

Turning to the global market outlook, Volvo’s economic “clock” indicates that two thirds of world markets are in growth mode while one third, and notably including the key U.S. market is in a slowdown. Growth market opportunities include the building of new road systems in China, India, Eastern Europe and other emerging markets, as well as increasing infrastructure investment in Europe and the U.S. Russia plans to increase is highways by 10 per cent to 670 000 km and double 4-lane roads to 8 000 km by 2010. In India there is an expected $500 billion in infrastructure investment while China has planned road development between 2005 and 2010 of 150 billion RMB each year. Recognition of these growth opportunities was part of Volvo’s rationale for its Lingong/SDLG acquisition, with Volvo to be marketed as the “premium” brand and SDLG will be marketed as the “value” brand.

According to Volvo’s first quarter reports, total world market conditions for 2008 are expected to remain on historically high conditions, although not as good as 2007. Within that overall growth, North America is expected to be down 15-20 per cent while Europe is expected to stay static at 2007 levels. The growth comes from the rest of the world where demand is expected to increase by 20 per cent. So what are the potential downsides in global equipment supply? Well, Helsham frets over whether all the new capacity coming on stream will result in over-capacity if the controversial concept of global economic coupling (to the massive U.S. market) becomes reality.

Pat Olney, president of the road machinery business line of Volvo Construction Equipment, quoted several reports which demonstrate the impact of infrastructure investment, or lack thereof, on economic growth. One such report indicated that the “[The] Indian government’s expenditure on road construction contributed more to poverty reduction than did (any) other investments…” 124 people lifted out of poverty per 1 million Rs ($23,400) invested on road infrastructure. Olney also pointed out the current underinvestment in U.S. road infrastructure at 0.75 per cent of GDP compared to 5 per cent for Russia and 3 per cent for both India and China. Comparing this data with projections that U.S. truck transport volumes will grow by 65 per cent from 1999 to 2020, Olney concluded that the U.S. market may be a sleeping giant.

By Andy Bateman, Editor
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Quebec launches biggest bridge repair project in Canada

The Jacques Cartier and Champlain Bridges Inc. (JCCBI), in conjunction with the Québec Department of Transport (MTQ), has announced the details of the project to replace the deck of the Honoré-Mercier Bridge which spans the St. Lawrence River approximately 10 km west of downtown Montreal. Built in 1934, the deck has never before been completely replaced. According to JCCBI, this project will extend the life of the bridge for another 75 years with a proven construction technique involving the use of precast concrete panels to minimize the project’s impact on bridge traffic. The project will also allow the installation of a combined bikeway/sidewalk path on the bridge to accommodate cyclists and pedestrians wanting to cross the river.

Glen Carlin, JCCBI general manager, said that the federal and provincial governments will finance the project, while The Jacques Cartier and Champlain Bridges Inc. will act as the Project Authority. The two phases of the project will require a higher total investment than the Jacques Cartier Bridge re-decking, making this the largest bridge repair project in Canadian history. Another highlight is the agreement involving the governments of Canada and Québec, and the Mohawk Council of Kahnawake, a Canadian first.

“The primary goal will be to minimize the impact on people’s normal bridge use, especially during rush hours,” Carlin said. From 2008 to 2011, major work to strengthen the steel structures and install precast concrete deck panels will require periodic lane closures outside of peak traffic periods. At all times, however, at least one lane in each direction will be open to traffic.

The re-decking project has been divided into two separate contracts. The Mohawk Bridge Consortium (MBC), a Mohawk business group, has been awarded Contract A, which involves strengthening of the steel structure and replacement of the reinforced-concrete bridge deck on the three access ramps that go through the Mohawk Territory of Kahnawake. This first phase of the project is valued at $66 million. Work has already begun, and will mainly involve the southern approach ramps on the federal portion of the bridge. Some of the work on the ramp decks will require traffic detours to speed up completion of this first phase of the project.

A public tendering process for Contract B is slated for the fall of next year. This phase will cover the federal portion of the bridge between the ramps covered by Contract A and the steel arch span over the St. Lawrence River, as well as much of the provincial portion of the bridge north of the steel arch span. This second phase will consist of replacing the deck using precast concrete panels.

A consortium of engineering-consulting firms specializing in major projects (BPR, Cima +, and Axor) will provide contract administration and oversee all work, in addition to providing traffic management during all phases of the project.
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Canada and Ontario joint road project

The federal and provincial governments, in partnership with the County of Essex, have announced funding for the widening of Essex County Road 22 from Lakeshore Blvd. to Patillo Rd. This project is one of several projects in the Windsor-Essex region that are being funded under the Canada-Ontario Border Infrastructure program. Some $300 million is being invested in the Windsor Gateway.

The widening of Essex County Road 22 from two lanes to four lanes, including major improvements to the Pike Creek bridge, will provide improved traffic operations, better highway access to the border for regional commercial and consumer traffic in Essex County and increased safety and capacity.

A call for construction tenders was issued at the end of June. Following the awarding of the contract, construction is expected to begin later this summer.

New five-lane bridge for Northern Alberta

Construction is underway on the new $127 million five-lane bridge across the Athabasca River in Fort McMurray. The new bridge will have the province’s largest bridge deck when it opens for traffic in 2011.

The new northbound Highway 63 bridge is part of the more than $600 million worth of transportation infrastructure projects underway or starting this year on Highway 63 – the main access route for Alberta’s oil sands.

The new bridge will be 33 m wide and 472 m long, with a deck area of 15 576 m². It will provide three lanes for northbound Highway 63 and two lanes for the northbound lanes from Franklin Ave., in Fort McMurray. The bridge will also include a 4.2 m wide sidewalk and major utility lines. The structure has been designed to carry up to a 6.4 m wide, 1.1 million kg overload vehicle, which is 12.5 times normal provincial highway bridge standards.

Approximately 50,000 vehicles per day use Highway 63 at the site of the new bridge.

Other major work currently underway or schedule to start this year includes: completion of 16 km of Highway 63 twinning south of Fort McMurray at a cost of $53 million; completion of 17 km of twinning north of Fort McMurray at a cost of $80 million; repaving 70 km of Highway 63 north of Highway 55 and the addition of two new southbound passing lanes at a cost of $30 million, and the start of construction on the new Thickwood Blvd. and Confederation Way interchanges at an estimated cost of $300 million.
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Skyway repair triggers extensive traffic planning

With huge volumes even at night, construction zone traffic management has become a major undertaking on the Burlington Skyway.

By Andy Bateman, Editor

When the first bridge was opened in 1958, the designers of what is now formally known as the Burlington Bay James N. Allen Skyway Bridge probably did not envisage the unrelenting growth in traffic volume that would follow. Volumes have increased eight fold from average annual daily traffic (AADT) counts of 17,000 in 1960 to 133,500 vehicles/day in 2004, resulting in the addition of a second bridge in 1985. With these volumes, construction zone traffic management has become a major undertaking during any topside bridge repair work.

Tony Thoms is project manager for general contractor ConCreate USL Ltd. on the current round of Skyway repair work. Thoms explains that the two high level bridges on this arterial Ontario highway carry the Queen Elizabeth Way (QEW) over the Burlington Canal. The original 1958 bridge carries four lanes of Toronto bound (northbound) traffic over the canal while the 1985 bridge carries four lanes of Niagara (southbound) traffic. Extensive repair work to bridge expansion joints would, at least on the night of Aggregates & Roadbuilding’s visit, require closure of all four Niagara bound lanes and full traffic diversion around the bridge. With volumes remaining high during the evening and at night, construction zone traffic control involved not only numerous contractor’s personnel but also the Ontario Provincial Police (O.P.P.) as well as City of Hamilton and City of Burlington police. Several Niagara bound access points ahead of the Skyway were closed, with all traffic diverted across the nearby lift bridge and along Eastport Drive before rejoining the QEW south of the Skyway.

The same night, resurfacing work on the Toronto bound lanes being completed under a separate contract would leave only a single bridge lane open for traffic during the night. On that bridge, Thoms notes that the subcontractors’ decision to pave on a Friday night was driven by allowed lane closures: “The four lanes on the section being repaved are numbered one to four from left to right (fast to slow) in the direction of travel. Work that night involved milling and paving a section of lane two and the consequent closure of lanes one, two and three. As a result, all traffic would be confined to lane four, with lane three providing a buffer between live traffic and the construction crews working in lane two. Contract conditions state that the three-lane closure could not begin before 11 p.m., while all lanes had to be fully reopened to

 Expansion joint edges were milled by a Bitelli planer making a 600 mm wide cut.

City of Burlington police. Several Niagara bound access points ahead of the Skyway were closed, with all traffic diverted across the nearby lift bridge and along Eastport Drive before rejoining the QEW south of the Skyway.

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SP 12.5 FC2 hot mix asphalt was placed by a new Caterpillar AP1055D paver equipped with Topcon controls and a 10-2SB Extend-A-Mat screed.
traffic by 7 a.m. on the following Saturday morning.

The resurfacing work is part of contract MTO 2007-2034, valued at $5.5 million, of which paving is worth some $1.5 million. Tender documents indicate that resurfacing extends 2.2 km including bridge approaches and involves the removal of 46 858 m² of existing asphalt to a depth of 40 mm. Some 4 800 tonnes of SP 12.5 FC2 mix will be placed to a compacted thickness of 40 mm, with subcontractors Hard Rock Paving and King Paving and Materials completing milling and paving respectively. Resurfacing began in the first week of June 2008 and is scheduled for completion in October.

King Paving’s vice president of operations John Hutter explained that the night’s paving target was 1200 lane metres of lane two, translating into some 4500 m² or 450 tonnes of hot mix asphalt. By 11 p.m., the work crews and an impressive array of equipment were in position. Hard Rock kicked off the milling work utilising the company’s Terex PR-800-7 cold planer, with the goal of milling a 1.5 km stretch of the 3.75 m wide lane in about six and a half hours. The PR-800-7 made rapid progress, pausing briefly to raise and lower across expansion joints. The edges of the joints were milled shortly afterwards by a Bitelli planer making a 600 mm wide cut parallel to the joint edge. Several pieces of clean up equipment supporting the planers included a Bobcat S220 turbo with sweeper attachment, a New Holland L170 skid steer loader with sweeper and box attachment as well as a Schwarz Industries M5000 broom sweeper. After giving the milling operation a start of about an hour and a half, the first of King’s paving crew went into action, applying tack coat with an Etnyre Black–Topper asphalt distributor.

Hot mix asphalt for the job was produced at the King Paving plant in Burlington, with the company’s delivery fleet including a Mack Vision tractor unit teamed with a new Trail King Industries Red River Series live bottom construction trailer. On site, the mixture was placed by a new Caterpillar AP1055D paver equipped with Topcon controls and a 10-25B Extend-A-Mat screed. Behind the paver, a Caterpillar CB534D roller in the breakdown position made two passes followed by a Bomag BW11RH nine-wheeled pneumatic roller making eight passes. At the rear of the train, a Bomag 164AD dual steel drum made passes as necessary to finish the mat. Asphalt raw material sources included Canadian Asphalt PGAC 70-28 asphalt cement, coarse and fine aggregates from the Rosewarne quarry of Fowler Construction Company Limited and chip sizes from the Havelock quarry of MRT Aggregates Inc.

Clean up equipment included a Bobcat S220 turbo with sweeper attachment.

The mat was finished by a Bomag 164AD dual steel drum roller at the rear of the paving train.
**Bergkamp**

Pavement maintenance made easier with new paver

A new truck-mounted slurry seal and micro surfacing paver is now available from Bergkamp Inc. that is claimed to be one of the most advanced pavers of its type on the market.

According to Bergkamp, slurry seal and micro surfacing are among the most efficient methods of preventive maintenance for highways, roads and parking lots. The main difference between slurry seal and micro surfacing is that slurry seal uses a standard emulsion which requires evaporation to occur and sets in several hours. Micro surfacing uses a polymer modified emulsion that produces a chemical reaction to force the moisture out and can set in less than an hour so traffic can return quickly.

The M310 allows operators to easily calibrate the machine, monitor production rates and quickly make adjustments during production. The unit is equipped with Bergkamp’s Electronic Mix Control and Diagnostic System (EMCAD) that displays current and average material ratios, total material used and material rates. It also can produce on-demand reports to track production for individual sections of the job, or the entire job, via an onboard printer. Operators can evaluate these printouts and make the necessary adjustments to improve the machine’s efficiency.

According to the manufacturer, calibration procedures on the M310 are simple with no manual calculations required. The system ties material ratios of aggregates, asphalt emulsion, water, additive and fines together with an electronic signal and automatically maintains the ratios with feedback loops.

The M310 carries a 7.7 m$^3$ of aggregate, 2270 litres of both asphalt emulsion and water and 303 litres of additive. The operator interface has joystick controls and slides to either side for improved visibility for the operator. Both the engine and pugmill run quietly. The onboard 99 hp Cummins diesel engine is positioned at the front of the unit in an enclosed compartment that further reduces noise for the driver and crew. The pugmill slides out for easier cleaning – the bottom bowl stays in the paver while the excess material falls out of the bottom for faster clean up. The fines feeder is positioned low so it is easily accessible for loading. All liquid tanks are removable for maintenance.

Aggregate is delivered to the pugmill by a 609 mm wide belt-over-chain conveyor while the steep hopper walls minimize bridging. A Roper gear pump, three-way valve and inline strainer allow trouble-free loading of asphalt emulsion onto the truck. New material can be loaded at full rate without affecting the production settings, states Bergkamp.

www.bergkampinc.com

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**Bomag**

New Bomag paver offers power and capacity

The new BF6615 self-propelled asphalt paver from Bomag has been engineered for larger, high-production commercial paving projects. Weighing in at 9300 kg, the BF6615 features a 99-hp Cummins water-cooled diesel engine that is turbocharged for consistent power at all altitudes. The engine’s ECO-mode feature saves fuel and reduces noise by automatically lowering rpm’s during stops and pauses.

At the same time, an exclusive load-sensing hydraulic system lowers fuel costs by delivering power only when needed.

The new design, UNIMAT 2 full-width floating screed has a standard 2.44 m to 4.57 m paving width. The screed is electrically heated, eliminating the need to change propane bottles in the middle of a large project. Dual vibrators provide 2,500 vibrations per minute.

The paver’s 8.1-tonne hopper capacity on the BF6615 allows high-production paving to continue between trucks. Even with its power saving system, the new paver can push asphalt feeder trucks while maintaining working speeds up to 55 m/min.

The BF6615 also features a crawler style track drive system...
Caterpillar launches new paver

The AP655D is the latest addition to Caterpillar’s line of asphalt pavers. According to the manufacturer, it has been designed for improved performance, operator comfort, ease-of-use, mobility, and reliability on assignments ranging from routine commercial jobs to demanding highway operations.

The AP655D features dual operating stations with the Advisor Monitoring System (AMS), tilting consoles, exclusive Mobil-trac undercarriage or steel track undercarriage, high capacity cooling system, belt or hydraulic driven generator system and Caterpillar’s unique material handling system with independent auger and conveyor controls. Power is supplied by a 174 hp Cat C6.6 turbocharged, 6-cylinder diesel engine. The deck-mounted cooling system provides cool intake air in order to maximize fuel efficiency and minimize emissions. A variable speed fan draws ambient air across the engine compartment and through the radiator. The exhaust air exits toward the hopper providing a cool engine compartment and working environment for the crew.

The AP655D includes dual swing-out operator stations with tilting consoles. The stations offer four different positions for good visibility to the operator’s surroundings. The stations can be positioned beyond the machine frame for greater visibility when precise paving control is required.

An Advisor Monitoring System located on the left operator station provides an interactive interface to assist the operator. The system includes project planning calculators, start-up checklists, engine operating parameters and many other features to assist the operator. The system also lists fault codes for machine functions, making troubleshooting quick and easy.

The Mobil-trac™ undercarriage offers increased traction when operating on unstable bases or on grades, low ground pressure and high flotation. High travel speeds give the AP655D Mobil-trac the ability to be quickly repositioned at job sites or driven to the next site. The undercarriage with standard bolt-on polyurethane track pads. Eight sealed rollers per side carry the weight of the machine, while bolt-on rock guards installed on the inside and outside of each track drive prevent asphalt from loading up on the chains. Each of the track drives is bolted to a cross member frame structure and can be removed individually for maintenance. The entire undercarriage structure can be removed as well.

The screed on the BF6615 features two abrasion-resistant, extendable, reversible and independent hydraulic augers. Evenly distributing a uniform layer of asphalt across the mat, the two augers extend with the screed extensions, providing consistent material control at all paving widths and minimizing the need for hand labour.

Screed extensions can be adjusted for a two-inch crown or invert. Screed wear plates are 9.5 mm thickness abrasion-resistant 400 Brinell hardened steel. Designed to withstand harsh job-site conditions, screed plates are bolted on for easy replacement.

The BF6615 features dual operating positions for control from either side of the paver. The engine is positioned low in the machine, giving the operator outstanding visibility from either side. Engine shroud is standard for heat and noise reduction. Fail-safe brakes are also standard. Both the augers and dual hydraulic slat conveyors offer full automatic control with manual override. This allows the operator to precisely control the amount of material being sent to the screed if paving wider or thicker on one side or the other.

The BF6615 is compact with a transport length of 4.57 m and a height is 1.87 m. For simple cleanup, the BF6615 features a hydraulically lifting bed and has all major components located outside the hopper. A standard fume extraction system helps reduce asphalt odour.

Other standard equipment includes urethane track pads, a high-engine water temperature/low engine oil pressure automatic shutdown, wash down spray system, swivel mounted bumper rollers and power depth adjustment controls for variable mat thickness. Optional equipment includes a swivel-mounted tow-type hydraulic truck hitch, working lights, ditch plates, simple Moba automatic joint matcher and Topcon screed automation system.

Mobil-trac can be purchased with either the raised tread-bar belt or the smooth belt. The smooth belt offers less disturbance of the base materials. The AP655D can also be purchased with a steel track undercarriage. The steel track undercarriage incorporates special quad-roller rear bogies, Cat D3 track rails, and automatic tensioning to deliver a smooth ride. The steel track undercarriage is available as a more economical alternative to the Mobil-trac.

The paver utilizes three steering modes, including PAVE, TRAVEL and MANOEUVRE. The MANOEUVRE mode is unique to Caterpillar. This mode permits the tracks to counter-rotate, allowing the machine to turn within its own footprint. This unique feature provides quick mobility in commercial applications when moving to a new starting point.

The independent material handling system provides precise mix delivery. The gateless material handling system promotes hands-free operation by providing features such as ratio control dials, and independent control of each auger and each conveyor. The independent operation reduces component wear and minimizes the potential for mix segregation. Reversible augers and conveyors assist the crew by reducing handwork and clean-up. The reversible augers are able to pull asphalt back into the main screed area when retracting the extenders while the reversible conveyors pull asphalt back into the tunnels, resulting in limited spillage.
LeeBoy unveils its largest paver

VT LeeBoy Inc. has introduced its 9000 asphalt paver, a 14,968 kg machine featuring a manoeuvrable, rubber tire design and a 2.44 electrically-heated screed system. Designed for large commercial, high production paving applications, the 9000 is powered by a 173-hp Caterpillar diesel engine. The engine is transversely mounted, which allows for better ground level access and cooling efficiency. A fume ventilation system vents asphalt vapours away from the operator and the screed area. An easily raised hood cover the low profile engine and the side grating can be quickly removed to provide access to the engine compartment.

The 9000 model features dual hydraulic slide-out operator stations for improved fore and aft visibility as well as fully equipped consoles that incorporate CAN Bus system design and digital gauges for monitoring paver functions and diagnostics. Paver steering is accomplished using Plus 1 control architecture with touch pads.

A two-speed motor with single reduction planetary torque hub enables the paver to travel at up to 19.3 km/h and at paving speeds of up to 76.2 m/min. The machine is driven by two large heavy-duty low pressure 19x29.5 tires. The 12x22 solid rubber front tandem steering bogie wheels oscillate to improve mat quality by overriding roadbed irregularities.

The material handling system on the 9000 paver begins with a 10-tonne capacity receiving hopper with heavy-duty, hydraulic radius hopper wings and high strength plastic flashing to prevent material spillage. Dual 457 mm slat bar and roller chain conveyors feed the 406 mm diameter hardened cast steel augers that push asphalt to the screed. The auger assembly can be hydraulically raised and lowered. Standard sonic feed sensors control the augers. The operator has independent left and right hand control of the conveyor system and material flow gates. Manual tunnel extensions are available to keep mix away from the drive tires.

The paver is equipped with a Legend electric screed system that extends hydraulically from 2.44 m to 4.72 m. An onboard 20 kW generator heats the main screed and the front-mounted extensions. The manufacturer’s exclusive heat element replacement system is designed for quick changes.

www.leeboy.com
Terex introduces paver upgrades

As part of a design enhancement program to boost productivity, the Terex CR662RM RoadMix material transfer vehicle and asphalt paver now features a new variable-pitch in-hopper configuration that is claimed to dramatically increase material throughput. The new pitch spacing, transitioning from 254 mm in the front to 279 mm then to 305 mm in the rear, more aggressively channels material to the rear of the machine for faster truck unloading. The new auger design helps to increase production capabilities to more than 454 tonnes/h. Even with a more aggressive pitch, the constant-diameter augers continue to re-blend 100 per cent of the material to combat both material and thermal segregation, according to the manufacturer.

A new conveyor assembly for the CR662RM features a stationary lift conveyor with flights averaging every other pitch – compared to the previous every third pitch – to reduce hydraulic pressure and more quickly channel material from the rear of the tractor to the swivelling conveyor. New hydraulic pressure gauges for the conveyors, mounted at the operator’s station, help to minimize the chance of plugging the system. Hydraulically operated clean-out doors and reversible

New pavers from Roadtec

Two new 2.44 m asphalt pavers have been recently introduced by Roadtec, an Astec Company. The RP-170 is a rubber–tired machine that replaces the RP-150 while the new the rubber-tracked RP-175 replaces the RP-155.

Both new models are powered by a Cat C6.6 ACERT Tier 3 diesel engine rated at 174 hp. The engines comply with the latest environmental standards while providing a 12 per cent increase in horsepower over previous models. Fuel capacity of both new pavers has also increased by 40 per cent to 360 litres on the RP-175 and 340 litres on the RP-170, allowing more hours of work before refuelling.

New, hydraulically-driven cooling fans provide a substantial drop in paver noise emissions for a quieter work environment around the paver. The new swing-out seat design and new operator control layouts that were previously introduced on Roadtec’s 3 m models are also standard on these new 2.44 m machines.

www.roadtec.com
conveyor flights aid in clearing obstructions.

The unique aspect of the CR662RM is that it functions equally well as a material transfer vehicle or as a remix anti-segregation paver. The manufacturer claims that the new in-hopper auger design enables the CR662RM to match or better production rates of conventional slat pavers, while giving the additional benefit of virtually eliminating segregation.

When equipped as a paver, the CR662RM incorporates two, 1524 mm long spread auger sections that deliver material to the left-and right-hand sides of the screed. A new spread auger design employs two independently controlled, variable-speed outboard drive motors, mounted to the tractor’s rear bulkhead. This eliminates the centre gearbox drive and, since the left-and right-hand auger sections back each other up, reduces the occurrences of centerline segregation.

Three screed models are offered to convert the machine into a paver including the diesel or electric Fastach®10, electric VersaScreed 10, and the electric or diesel Stretch 20®.

For use as a material transfer vehicle, the screed and spread augers are removed from the tractor and replaced by the conveyor assembly. The RoadMix MTV is capable of delivering continuous, non-contact and off-set paving capabilities. Asphalt is immediately channelled from the receiving hopper to the rear of the machine, providing reduced handling time and virtually eliminating hot mix temperature loss. Material passes through the stationary 940 mm wide life conveyor to a 762 mm wide swivel conveyor. The second conveyor swings 55 degrees to the left or right of centre and offers a hydraulically variable discharge height from 1.85 m to 2.94 m.

The CR662RM features Terex’s patented Smartrac rubber track drive system. Oscillating bogie wheel assemblies combine with the system’s frictionally drive rubber tracks to automatically apply the correct tension, whether in forward or reverse. The rubber track drive spreads the machine’s 24 495 kg weight over a larger area, resulting in a low ground contact pressure of less than 12 psi.

New electric screed offers more flexibility

Terex Roadbuilding has introduced its new VersaScreed 210 electric screed for paving large parking lots, highways and city streets. The new 3 m screed features hydraulically variable paving widths from 3 m to 5.6 m, 457 mm wider than previous designs. By adding left-and right-hand bolt-on screed extensions, the VersaScreed 210 delivers full-width paving to 6.6 m.

The front-mounted screed extension design of the VersaScreed 210 allows for fast width changes with less shovelling and handwork, states the manufacturer. Its wedge-shaped front extensions automatically shed asphalt when narrowing paving widths, which eliminates asphalt trapping and improves mat quality. On-the-fly angle of attack extension adjustments also help to maintain uniform mat texture. In addition, the new screed incorporates 127 mm diameter vertical and 102 mm diameter horizontal tube supports that prevent screed deflection, even at extended paving widths, to improve mat smoothness.

The reversible 610 mm wide main and 203 mm wide extension screed bottoms are constructed of AR400 Brinell hardened alloy steel for longer service life. Spring-loaded end gates maintain constant contact with the subgrade and are mounted to heavy-duty 19 mm thick end plates for added service reliability.

The electric heating system quickly brings the screed bottoms to paving temperatures. Eliminating smoky start-ups, the 34 kW three-phase generator allows contractors to heat screed bottoms on the way to the job site while offering ample reserve power to run auxiliary equipment such as lights for night paving operations. Two thermostatically-controlled zones automatically maintain minimum set temperatures for both left-and right-hand main screed and extensions.

All screed controls - including crown adjustment, extension slope and extend/retract, and match height – are electric over hydraulic for more reliable operation.

www.terex.com
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Focus on Asphalt Pavers

New series pavers from Vögele

Two new 3 m asphalt pavers have been by Vögele America Inc., a member of the Wirtgen Group.

Called the Vision Series, the models include the tracked 5200-2 and the wheeled 5203-2. They are described by the manufacturer as quieter, cooler and more productive than the company’s predecessor models.

The new series has been completely designed from the ground up to incorporate the latest in paver technology. The slope of the machine and hood have been configured so the operator can see the sides, the hopper and the conveyors in back, without having to move around. The operator’s station swings out from both edges for improved visibility to the sides, behind and into the hopper. In addition, the control console slides from one side of the paver platform to the other, and also swivels and tilts. Streamlined twin exhaust pipes redirects exhaust fumes and heat away from the operator and crew. No exhaust stack is located in front of the operator.

On the wheeled Vision 5203-2, three drive versions are available – one with rear wheel drive, one with optional two-wheel front wheel assist, and a new optional six-wheel drive version.

An optional hydraulic front apron eliminates much of the usual shoveling in front of the paver. As the hopper closes, the front apron rises preventing forward spillage of the asphalt material.

Self-diagnostics are built into the new series. Fluid levels and other inspection points are monitored automatically from a central display panel, eliminating daily manual checking by the crew. Similarly, self-tensioning conveyors on the new pavers have hydraulic cylinders that keep them adjusted.

Both the 5200-2 and the 5203-2 pavers have independently operated hopper wings. One side can be dumped, or the other, or both at the same time. Vögele has also eliminated the flow gates and implemented independent conveyor and auger drives. Each conveyor is driven separately and independently from the auger. Augers and conveyors are reversible. The tracked 5200-2 features a mechanically-lowered strike-off plow in front of the rubber tracks that prevents the machine from going over a hump of material, or getting asphalt mix in the tracks. The long crawler tracks are fitted with wide 457 mm pads for maximum tractive effort and navigation. Misalignment of the rubber track has been eliminated due to the zero clearance between track rollers and the rubber tracks.

A separate drive and electronic control is provided for each crawler track for better stability and improved steering accuracy. Engine power is translated into pave speed with loss of power as the drive units are integrated in to the crawler track drive wheels.

Both pavers are powered by a six-cylinder Cummins Tier 3 diesel engine that delivers 240 hp at 2000 rpm. Different speed ranges are selected at the push of a button. The options are MIN, ECO Mode and MAX. At 1800 rpm, ECO Mode provides low noise level and less fuel consumption, sufficient, says the manufacturer, for most paving operations.

The 11.7-tonne capacity material hopper has two cylinders per side to provide smooth operation. The slope inner design improves the mix flow to avoid segregation. Large truck push rollers can be set to three different positions for shock-free docking of trucks. Proportional control and continuous monitoring of conveyors and augers ensure a constant head of mix in front of the screed. Proportional control allows the conveyors and augers to deliver exactly the amount of mix actually required. Because separate drive and material monitoring is installed for each conveyor and each auger, mix material can be spread in the auger tunnel when conveyors are not running.

Three electric screeds are available for the new pavers including the Carlson EZ-III 1017 and EZ-IV 1019 with front-mounted extensions and the HR 500 E rear-mounted screed. No diesel-heated screeds are available.

With ErgoPlus controls at the screed, paver functions are logically arranged and clustered in groups reflecting the needs of the paving site. Direct access to the paver is achieved via push buttons. Reversal of auger rotation, for example, can be easily done by the screed operator at the touch of a button.

www.vogeleamerica.com
New windrow elevator has remixing capabilities

Weiler Products has introduced its new 250 hp E1250 self-propelled material transfer vehicle for continuous, non-contact asphalt paving projects. The optional power remix transition hopper remixes both size and temperature segregated particles to help achieve smoothness bonus, according to the manufacturer. The E1250 also allows offset paving over barriers, string lines or other obstacles that make it difficult to position trucks in the front of the paver for inline paving.

The E1250 was designed and built with a low centre of gravity and a tight turning radius. Weighing 22 000 kg, the MTV is 3.5 m high and 13.7 m long. It has a maximum transport speed of 15.4 km/h and a variable working speed of 0-3.7 km/h. The hydrostatic drive train eliminates the need for a gear box and gives the operator two-speeds for on-the-fly shifting from working speed to transport speed. It also features drop out floors in the elevator, remix hopper and conveyor to facilitate maintenance.

The operator’s station has tilt-wheel steering and ergonomically positioned controls for improved productivity. The operator can operate the unit from either side of the machine by simply lifting a spring-loaded pin.

According to the manufacturer, the remix hopper incorporates two interlaced 406 mm diameter segmented augers for better remixing capabilities since the augers are not completely covered. There is only 50 mm to 127 mm of material in the hopper at any given time which permits both side-to-side and top-to-bottom mixing. The 1524 mm wide elevator is driven by two direct drive, high torque motors giving the elevator a capacity of 907 tonnes/h. The 762 mm wide conveyor is driven by another direct drive, high torque motor for a 544 tonnes/h loadout capacity.

Optional equipment includes a 9 kW generator, a hydraulic truck hitch, a rotating LED beacon, a conveyer light package, an 11.7-tonne capacity hopper insert and a 4.5-tonne hopper insert extension.

www.weilerproducts.com
For aggregate users, low moisture content can be an important property of an aggregate operation’s sand and other fine sized products. Whether the sand is destined for concrete, asphalt or other applications, customers, perhaps not surprisingly, want to pay only for the sand and not for excess water. At the CBM McNally pit near Aberfoyle, Ont., a new sand production plant is producing drier concrete sand while simultaneously delivering cost savings to the producer.

John Pennings is the plant manager at the McNally pit and explains that the new sand system is part of an integrated crushing spread producing a full range of aggregates. Products from the pit are in strong demand, particularly fine and coarse concrete aggregates for the company’s ready mix operations. On the day of Aggregates & Roadbuilding’s visit, there was certainly little sign of any slowdown in the Ontario economy with a steady stream of highway trucks hauling product across a new scale.

The new sand production leg itself consists of a surge bin, twin rinsing screens, and twin dewatering screens with an integral separator. In operation, minus 24 mm feed material from the main spread first enters the ElRus surge bin which controls the flow of feed to a matched pair of Terex Simplicity 6x20 triple deck wet screens. The load spreading top decks of these screens are fitted with 16mm wire mesh while the middle decks are fitted with urethane screens having both 9.5 mm and 7.9 mm openings. Product from the top and middle decks are combined and conveyed to the crushing side of the plant for the production of coarse concrete aggregate. The screens’ bottom decks are fitted with urethane media having 3.2 mm openings. Chip (minus 7.9 mm plus 3.2 mm) passing the middle deck and retained on the bottom deck is stockpiled separately while a mixture of rinse water and minus 3.2 mm material passes through the bottom deck and into a slurry tank under the screens. Sand slurry from this tank is pumped by an LPT 10x8 pump up to a McLanahan 920 mm diameter separator. Separator overflow containing mostly unwanted minus 200 mesh fines exits from the top of the cyclone while partially dewatered underflow discharges onto a second dewatering screen designated DS-2 fine. Coarse and fine sand from both dewatering screens is combined on a common product conveyor belt and stockpiled.
as a drip free cake. Although it has not been used so far, a gate located in the coarse dewatering screen’s discharge chute allows some of the coarse fraction to be diverted to a separate stockpile, thereby increasing the ratio of fine fractions in the main sand product.

Overall, Pennings is pleased with the new system on a number of counts: “The concrete sand produced by the previous system tended to be on the coarse side, making it necessary to adjust the gradation by the addition of fine sand. That step is no longer necessary as the new plant has improved fine sand fraction recovery to the point where the product stream meets specification without further adjustment. In addition to eliminating the costs of fine sand addition, improved fine sand recovery also means an increased ratio of saleable product and a similar reduction in the loss of saleable fractions going to waste.” Pennings adds that the reduced moisture content of sand from the new plant, typically about 7.5 per cent off the dewatering screens, benefits both customer and producer. For customers, drier sand product means that sand can be shipped soon after production at times of peak demand, thanks to reduced stockpile drain down time. For the producer, drier product translates into higher stockpiles which consume less real estate than the slumped stockpiles of wet product. Drier product also improves haulage efficiency with a higher sand to water ratio in each truckload. As Pennings points out, every 1 per cent reduction in moisture content means 10 tonnes more sand and 10 tonnes less water in every 1000 tonnes of product delivered. Finally, the plant is delivering expected productivity by averaging 200 tonnes/h of finished product. Even at this output rate, the plant is operating well within its maximum rated capacity of 300 tonnes/h.

As an interesting aside, Pennings points out that the surge bin installed at the head of the sand system serves multiple purposes. In normal operation, the surge bin helps to maintain a steady flow of material to the sand screens by absorbing any pulses or interruptions in the flow of feed material. That steady...
flow helps to improve product consistency as the rinsing and dewatering screens see a consistent material load. At the same time, the surge bin minimises the opportunity for screen or slurry tank overloading by preventing large surges of feed material reaching the screens. The design of the surge bin also allows the sand leg to be isolated from the rest of the production spread when required.

In this operating mode, the bin’s feeder is turned off and feed material accumulates in the bin. Excess feed discharges down a chute on the back of the bin and from there conveyed back to a feed stockpile. Later on, the feed can be recovered and baled directly back into the surge bin by a wheel loader.

Technical details on the dewatering screens indicate that screen DS1 is a 6x12 VD 18 unit equipped with two 6-hp motors, while screen DS2 is a slightly smaller 5x12 VD 15 unit, also equipped with two 6 hp motors. Each screen is equipped with a feed box, discharge chute, underpan and TEMA Isenmann 305 mm x 305 mm urethane panels, while both are equipped with two sets of dams to allow for maximum water drainage and dewatering. On the coarse screen (DS1), the screen panels in first eight rows from the feed end have 2 mm apertures while the remaining four rows have 1 mm apertures. With these screen openings, the typical product gradation off DS1, measured as per cent passing each respective sieve size opening, is 100 per cent 6 mesh, 83 per cent 8 mesh, 50 per cent 16 mesh, 6 per cent 50 mesh, 2 per cent 100 mesh and 1 per cent 200 mesh.

On the fine screen (DS2), the whole deck is fitted with 0.3 mm aperture panels, resulting in a product gradation of 100 per cent 16 mesh, 42 per cent 50 mesh, 11 per cent 100 mesh, and 1 per cent 200 mesh. By comparison, the typical gradation of waste from the separator overflow (again, measured as per cent passing each sieve opening) demonstrates how unwanted fines are being removed from the finished product: 100 per cent 50 mesh, 96 per cent 100 mesh and 76 per cent 200 mesh. The typical water flow rate through the system is 8328 litres per minute at a solids feed rate to DS1 of 270 tonnes/h. If necessary, the water system has the capacity to provide an additional 1136 litres per minute. The finished sand product has a design moisture content of 15 per cent (85 per cent solids).

According to the LPT Group, the Velco Dewatering (VD) Screen was introduced 25 years ago and has stood up to the most arduous mining and aggregate duties during that time. Designed primarily to remove excess water from sand fractions, the dewatering screens provide drip-free discharge to improve housekeeping and inventory management. If required, a divided screen can accommodate two to three products at one time, allowing for separate products or desired blending. The screens are typically positioned after a screw washer, cyclone, or classifying tank, with their relatively dry product available for immediate load out.
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Aggregates & Roadbuilding recently visited Ottawa to see at first hand how contractors are turning the capital’s ambitious infrastructure program into reality. At different sites, roadbuilders have tackled the challenges of downtown street reconstruction, residential street resurfacing and difficult ground conditions.

**Downtown renewal**

In 2007, Ottawa City Council identified infrastructure renewal as a priority and approved a three-year levy to fund infrastructure projects in the city’s 2008 budget. Seventeen major projects are listed for this year, including the Wellington St. West Phase One reconstruction valued at $12 million.

Located in downtown Ottawa, the comprehensive Wellington St. West reconstruction includes watermains, sanitary, storm and combined sewers, lateral services to the property line, utilities, a traffic control signal system, road structure and pavement, street lighting and signage as well as transit facilities, cycling facilities and sidewalks. Work is being completed in three successive construction phases. Construction on Phase One covers a ten-block section between Parkdale Ave. and Western Ave. in 2008 under City of Ottawa contract ISB07-51777. Phase Two, between Parkdale Ave. and Bayswater Ave. will begin in 2009 while Phase Three on Somerset St. West, from Wellington St. to Champagne Ave. North, will begin in 2010.

The general contractor on the Phase One project is Ottawa Greenbelt Construction Co. Ltd., with R.W. Tomlinson Ltd. a principal subcontractor.

Sewer work by Greenbelt totals some $4 million, while Tomlinson’s scope of work includes excavation, granular base, curbs and paving with a tender value of $4.2 million.

Project engineering and design adds about another $4 million for a total project value of over $12 million.

Yves Bisson, project manager for Tomlinson, explains that the complete reconstruction of an existing street, including above-grade and below-grade infrastructure, results in a complex construction process. Within the construction zone, for example, work to remove or replace below-ground municipal services can take significantly longer than greenfield installation. In the case of some existing buried cable ducts, the existing protective tile surround has been replaced with concrete encasement, a labour intensive process involving extensive hand digging and the temporary slinging of cables prior to concrete placement. Elsewhere, water jetting has been used to expose underground services rather than risk damage by an excavator, however carefully operated. Activities are further complicated by the requirement to maintain pedestrian access to businesses within the construction area. That require-
ment has meant the frequent setting up and moving of temporary fencing to delineate the site as well as crossing guards to control pedestrian traffic at designated crossing points. The site is also challenging for equipment operators due to tight manoeuvring space and restricted access. In addition to being vigilant for the presence of construction personnel, operators are frequently working close to existing line poles, overhead phone cables and other objects.

Vehicle traffic management can be challenging in these congested locations, both outside and within the construction zone, and considerable effort goes into minimising traffic delays. Outside the fence line, police assistance is occasionally sought to direct traffic at busy project intersections, although some traffic delays inevitably occur from full detours or lane closures. For the site itself, vehicle access has to be maintained for large trucks delivering bulk construction materials as well as smaller vehicles. Bisson notes that bulk quantities are relatively high per kilometre of roadway, partly due to the decision to fully reconstruct the pavement. Principal material quantities include 16 000 m³ of excavation, 17 000 tonnes of Granular B placement and 7 000 tonnes of Granular A base material, 3 500 tonnes of SP19 level D asphalt with PGAC 58-34 as well as 1 500 tonnes of SP 12.5 FC1 level D surface asphalt. Significant street landscaping adds 7 000 m² of interlocking brick, 130 trees and shrubs and 70 aluminum lighting poles to the materials list.

This somewhat daunting listing of challenges aside, Bisson is pleased to report good progress and a project on schedule.

**Ottawa resurfacing program**

Away from the downtown area, Aggregates & Roadbuilding’s visited a suburban residential street being resurfaced under Ottawa’s asset renewal program. Southvale Cres., located some five kilometres east of downtown Ottawa, is one of at least thirty five locations being resurfaced under an annual resurfacing program that is expected to total $11.34 million in 2008. City budget documents explain that the program is required to preserve and extend the life of the infrastructure and prevent roadway failures requiring more extensive reconstruction.

The Southvale Cres. Resurfacing project called for the milling of 12 000 m² of old surface asphalt to a depth of 50 mm in preparation for a new surface lift. Work was being done on a regular weekday morning, necessitating traffic control to handle the typical busy traffic flow of commuters, schools buses and delivery vehicles. The centrepiece of the milling train was a Roadtec RX-900 cold planer, supported by a water tanker, clean up

A Vactor HXX Hydro-Excavator was utilised on the Wellington St. West project to loosen and remove soil around buried utilities. The unit’s ability to work on frozen ground may be useful in one of the world’s colder capital cities.
clean equipment and a truck fleet. Gilbert Dupont, milling foreman for R.W. Tomlinson Ltd., explains that this three-track RX-900 is moved frequently and tackles a variety of milling jobs. Like other urban or suburban work sites, the presence of numerous utilities on this jobsite required close attention by the planer’s operators. Unlike highway or main line work where there are rarely any utilities in the roadway, the planer has to make frequent stops to avoid manhole covers and other utilities in the road surface. The cutter drum is raised ahead of any obstruction and lowered after it to allow milling to resume. Any unmilled areas are removed later with a small cold planer, backhoe bucket or by hand.

On this job, the RX-900 was working well within its capabilities, making a shallow cut in relatively unabrasive asphalt, while at other locations the planer has been used to mill at its maximum rated cutting depth of 355 mm. Component wear rate on the RX-900, like other milling machines, is a function of both the cutting depth and the physical properties of the aggregates in the asphalt being milled. In this case, the asphalt’s limestone aggregates wear cutter teeth more slowly than asphalt in the capital region containing dolomitic sandstone or granite aggregates.

Dupont adds that it is important to clean up milled material soon after the milling pass, for a number of reasons. Where milling is taking place close to live traffic, rapid clean up avoids material scatter by vehicles and also avoids any debates over body or windshield damage, particularly on a job such as this where paving was not scheduled to take place until the following day. On all sites, the milled surface has to be clear of loose material prior to tack coat application and paving so quick clean up is good site practice in any case. Tomlinson’s crew certainly wasted no time in picking up milled material here, utilising a multi stage clean up system. During milling, most of the material generated by the cutter was conveyed directly by the RX-900’s 1067 mm wide front load out conveyor to a supporting truck. Immediately behind the planer, a Schwarze Industries M5000 street sweeper travelling gathered millings for periodic discharge into another waiting truck. As a further measure, a Case 570MXT backhoe loader equipped with side and rear sweeper brushes was positioned at the back of the train to pick up any remaining material. With another job completed, the asphalt recycling cycle process continued. The RX-900 was moved to its next site while, back at Tomlinson’s hot mix asphalt plant, the millings from Southvale Cres. were stockpiled for use in the next recycle mix.

**Infrastructure development**

In addition to renewing existing infrastructure, Ottawa’s program for the future includes significant investment in new infrastructure. One of the major current projects is the Transitway, described as the largest project in the City’s transportation history. The West Transitway Extension from Bayshore Transit Station to Pinecrest Rd. is dedicated to buses only and runs along the north side of Highway 417, with a barrier separating buses and highway traffic. The completed project will include the Bayshore Transit Station, a Transitway underpass bridge on Richmond Rd. and a Transitway underpass bridge on each of the two Highway 417 interchange ramps at Richmond Rd. on the north side of Highway 417. Construction of the transitway will also include associated storm sewers, retaining walls and an upgraded sound barrier wall. A new transit stop including shelters and pedestrian access to Durnaurier Ave. will be constructed on a new bus access ramp intersecting Pinecrest Rd. at the existing westbound Highway 417 off ramp intersection. The existing 417 westbound on ramp at Pinecrest Rd. will be relocated closer to Highway 417. Site work on the three year, $27 million project began in June 2007 with an August 2009 scheduled completion date.

R.W. Tomlinson Ltd. is the general contractor on the $27 million project with Ottawa Greenbelt Construction Co. Ltd. as subcontractor. For Ottawa Greenbelt, one of the principal challenges of the job has been the installation of about one kilometre of 900 mm diameter storm sewer through variable site conditions, including running sand, hard pan and rock. Sewer pipe installation in the latter conditions, rock, proved to be the most difficult. Drilling and blasting would have probably meant relatively fast progress, but blasting was not allowed in this case due the close proximity of traffic on Highway 417. The contractor’s solution here was to break rock down to the required sewer line elevation, just ahead of a trench box containing an exposed sewer pipe section. Once sufficient rock had been broken, the breaker was replaced with the regular machine bucket. Terex TA30 ADTs loaded with rock then made the short run of some 20 m from the front to the back of the trench box, where dumped material was levelled by a Caterpillar 963 track loader. As rock breakage progressed, the trench box was progressively pulled forward to allow the installation.
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Residents of Calgary will be well aware that the city’s growth has been accompanied by the seemingly inevitable growing pains of traffic congestion. This report describes one of several current roadbuilding projects to ease congestion.

The intersection of Beddington Tr. and Country Hills Blvd. is located in northwest Calgary and has seen rapid increases in traffic volumes with the growth of new residential communities on the north and west side of Calgary. Commuter traffic on both of these four lane roads has translated into significant delays, particularly during the morning and afternoon rush hour periods. Andrew Buchner, project coordinator for the Graham Construction and Engineering joint venture, explains that the project has three main elements to alleviate congestion. The project’s principal bridge structure will carry Beddington Tr. over Country Hills Blvd., while an existing bridge east of the intersection is being widened to accommodate an exit ramp for westbound Country Hills Blvd. traffic joining Beddington Tr. northbound or southbound. The third structure, a separate pedestrian bridge just west of the intersection at Sanderling Dr. brings the values of the structures on the project to $13.7 million. Roadworks add $11.3 million, with utilities and street lighting adding another $2 million and $630,000 respectively for a total tender price of $32.3 million including contingency allowance and taxes. The contract was awarded in October 2007 and work began on site in December of that year. The two-year project is scheduled for completion in fall 2009.

This interchange improvement is Phase 6 of the SBC (Shaganappi Tr./Beddington Tr./Country Hills Blvd.) widening project being undertaken in response to growth in the northwest portion of the city. It includes four sections of roadway improvements including the interchange at Beddington Tr. and Country Hills Blvd. Phase 1 of the project, Beddington Tr. Widening from Deerfoot Tr. to Country Hills Blvd., includes widening Beddington Tr. from four lanes to six with intersection

A John Deere 450C LC excavator loads fill for the interchange’s main bridge structure.
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☐ 2 million - 4 million
☐ over 4 million
improvements at Beddington Tr. and Beddington Blvd. as well as Beddington Tr. and Berkshire Blvd./Country Hills Close. Phases 2 and 3 involve widening Shaganappi Tr. between Edgemont Blvd. to Hidden Valley Dr. from three lanes to five, three lanes southbound and two lanes northbound, and the widening of Country Hills Blvd. from four lanes to six from 14 Street N.W. to Hamptons Dr./Edgebrook Blvd. Phase 4 sees the widening of Country Hills Blvd. from four lanes to six between Beddington Tr. and Shaganappi Tr. with intersection improvements at Country Hills Blvd. and 14 St. N.W. A 5th and final phase is currently being reviewed and would see the widening of Beddington Tr. from Country Hills Blvd. to Stoney Tr. N.W. from four lanes to six if given final approval. Currently there are no plans to construct Phase 5.

The unusual arched pier was completed in a single pour. The post-tensioned bridge pier incorporated DWYDAG 63 mm post-tensioning bars in addition to regular tendons.
Construction is currently progressing on Phases 1, 2, 3 and 6 with the completion of Phases 1, 2 and 3 slated for later this year while Phase 6 will be fully opened to traffic in the fall of 2009. Phase 4 will be tendered some time later this year or early next for a 2009 construction season with an anticipated completion for the fall of that same year. Aside from the SBC Project, the city is also undertaking a small but crucial piece of widening on Deerfoot Tr. between Beddington Tr. and McKnight Boulevard N.W. that will see the addition of one right lane in the southbound direction to help alleviate some of the congestion on Deerfoot Tr. created by commuters trying to make their way into the downtown area. The city is undertaking this project on behalf of Alberta Transportation as it has a direct affect on the widening work associated with Phase 1.

At the time of Aggregates & Roadbuilding’s visit to the interchange, earthworks subcontractor KLS was focussing on the placement and compaction of fill behind the main bridge abutments in preparation for placement of the twenty eight concrete girders. Some 120 000 m³ of imported soil fill was being compacted to a specified 100 per cent density for the top two metres and a minimum of 95 per cent beneath. During the same visit, formwork was being struck from the just completed single concrete pour of the bridge’s central pier. As a footnote, Buchner adds that the pier was completed in a single pour, with the somewhat unusual arched pier design incorporating post tensioning through the base and additional post tensioning in both shafts and the diaphragm.
The “Redline” product range is described by Leica Geosystems as the most complete 3D positioning solution in the construction industry. PowerBox is machine-ready GNSS for direct mounting on dozers, graders and excavators, compact enough for use as a backpack rover system. The PowerAntenna “smart antenna” is ready for on-the-pole rover work with Leica SiteForeman or on-the-machine with a PowerBox to provide a dual-GNSS position system. PowerTracker is said to be the simplest full-function robotic tracking total station on the construction market, featuring high-rate tracking for fine-grade machine control and available full robotic rover capability for easy one person stakeout, layout, and as-built checks. According to the manufacturer, PowerController with Leica SiteForeman by Carlson combines industry-leading construction application software with the PowerController to provide the full power of RedLine. Leica SiteForeman by Carlson features a simple workflow to make every construction task quick and easy from initial planning to as-built checks.

Leica Geosystems’ new PowerBlade machine control system offers precision laser-based grading available for every machine and budget. Designed for construction use, the Leica PowerBlade system features the MCP-700 Control Panel and MLS700 Laser Sensor with bright LED displays. An optional electric mast provides easy grade adjustment from the cab and advanced land-levelling features, with a variety of hydraulic options available to complete the system.

PowerDigger features a large, see-at-glance colour display screen giving the operator precise information on the depth and position of the excavator bucket. Operators can reportedly dig with ease and confidence even in demanding “blind cut” situations. Multiple job settings let the operator switch between different digging profiles at the touch of a button, and custom profiles can be created on the machine to continue from existing ground profiles.

According to Leica, the PowerDigger 3D excavator guidance system is now capable of saving up to 20 per cent in operating costs. This advanced system includes a choice of single or dual GNSS (GPS + GLONASS) PowerBox and PowerAntenna sensors, integrated with the PowerDigger excavator guidance system to locate the exact 3D position of the excavator bucket relative to the site design surface in real-time. The PowerDigger 3D always displays the machine’s position relative to the 3D design surface, in any site conditions and can operate in single and dual GPS/GNSS configuration.

www.leica-geosystems.com

The GS-506 grade control system for graders and dozers features a new ergonomic control panel with integrated shield combined with its manual contrast control. According to the manufacturer, these allow for clear reading in all light conditions, while the intelligent software architecture is said to guide the user through all functions of the system and allows for easy adjustments. Like previous systems, five sensors are used to control the blade. Rotation, long-slope, and cross-slope measurements are all combined with either the new MOBA SonicSki+ or/and the new LS-3000 laser receiver.

The new MOBA SonicSki+ is said to be the most precise ultrasonic sensor available and features extended side-shift-functions and a working range of up to 1.22 m. Six transducers and proprietary
software allow the operator to use the system easily over a stringline, edge of curb, or ground.

High performance of the MOBA laser receiver LS-3000 is promised in the grading of large areas, aided by high accuracy and full 360° detection range. The optional MOBA electric-mast is controlled through the GS-506 controller to provide rapid adjustment of the laser receiver. The modular design of the GS-506 system facilitates upgrade from a basic 2D grade and slope system to a total 3D control system using either a robotic total station or GPS receiver.

Control panel of MOBA GS-506 grade control system.
GPS technology incorporates a unique zone-beam laser transmitter, the PZL-1, that sweeps a 600 m area with a 10 m high wall of laser light. A compact sensor, the PZS-MC, is mounted on a mast which is attached to the toe arm of the paver. Any time the PZS-MC sensor is positioned within the laser zone signal, the system provides vertical data resulting in millimetre vertical measuring precision.

(Editor’s note: See the January/February 2008 issue of Aggregates & Roadbuilding for a job site report on the Topcon Millimeter GPS).

The X62 and the X42 are two new additions to Topcon Positioning Systems’ series of excavator grade control systems. The new X62 solution for excavators is an affordable basic system that can be upgraded to full 3D GPS+ control. In this system, core sensor infrastructure is installed, allowing an excavator to work in a variety of everyday grading applications. The X62 can be used for cutting slopes, excavating trenches for utilities as well as digging footings and basements. The system includes the GX-60 touch screen graphical display and four 360 degree tilt sensor all connected via a CAN-Bus configuration. The X62 allows the user to receive multi-constellation signals - GPS and GLONASS - for maximum signal reception in all conditions.

In the X42 system, Topcon offers a high-performance, low-cost option that is ideal for large or small excavators and backhoes for use in applications where basic indicate control is all that is needed. The X42 offers the same level of reliability contractors expect of Topcon products at a more economical price. This system consists of four tilt sensors, the new GX-40 graphical display and a detachable light bar for grade indication. The GX-40 display offers a high level of functionality using easy-to-read keypad buttons.

An optional LS-B10W laser receiver can be added to both units to provide a constant elevation benchmark for the machine when it moves to a new position.

Topcon Positioning Systems’ SiteLINK is described as new technology providing the first comprehensive information technology solution for every machine on every job site, regardless of location. According to Topcon, SiteLINK’s wireless communications mapping, data logging, reporting and asset management system for off-road equipment, provides the world’s first solution with the ability to work with any make, model or type of job site machine, regardless of manufacturer and age. The new technology is based on utilization of Mesh Radio Networks built on a standard Wi-Fi environment. The new communications system, can also pinpoint via GPS any make of equipment on a job site, serving as a built-in theft protection program. SiteLINK was developed jointly by Topcon and TSD Integrated Controls, a joint venture company of Topcon and Sauer Danfoss, the world-leading developer of electro-mechanical hydraulic systems. In addition to monitoring fuel levels, oil pressure, temperature and hours of use via CAN bus or analog connections, data that can be collected, stored and processed for individual machines include productivity (by various standards), geometry files, real-time machine position and history with optional GNSS+ receiver hardware and percent of selected jobs completed. Via Internet hook up, or cell phone connection, Topcon’s SiteLINK tracking and reporting software and controller can be accessed from virtually anywhere in the world.

www.topconpositioning.com
The new Trimble CM310 Compaction Sensor provides the display of real-time material density to the earthworks compactor operator. This capability is designed to increase machine productivity while providing complete, consistent material compaction over the entire construction project. Faster compaction with better in-place densities are expected to improve the efficiency of other earthworks operations, such as haul truck times and water management.

The Trimble CCS900 Compaction Control System with the new sensor is designed to provide the contractor with better control over the compaction process, making operations more efficient and productive. The contractor can compact sub-surface material to a target density and number of machine passes, analyze sub-surface grade post-compaction for deficiencies in the surface (whether certain locations are high, low or on grade), and catch grade control mistakes in real-time, prior to the start of the final road building process. The CCS900 system is designed to offer rugged durability and reliability standards and can be installed on any single drum soil compactor with open or enclosed cab without fear of component failure or damage.

Trimble’s new SCS900 Site Controller Software promises increased efficiency and productivity through real-time communication with the construction site. As part of the Trimble Connected Site™ portfolio of construction solutions, the new version of Trimble SCS900 software increases work flow efficiency by providing real-time transfer of data between the office and job site. Engineers can email design changes or work orders to contractors and crews in the field. Likewise, the contractor can transfer progress reports, on-site problems, and as-built data back to the office on completion of on site operations. The system eliminates the time and cost of physically driving data updates to and from the field. Using the two-way data capability will reportedly reduce delays and re-work associated with using outdated information and synching data only at the end of the work day. Reduced delays and re-work increase the likelihood that projects finish on time and under budget. The SCS900 Site Controller Software operates on the Trimble TSC2™ or TCU hand-held controller. Using total station or the Global Positioning System (GPS) technology, the software is designed to simplify construction operations, increase efficiency in the field, and minimize downtime. The Trimble SCS900
software can be used to perform initial site measurement and verification of original ground levels, measure site features, check finished grade and laid material thickness, Topographical measurement of site or material stockpiles and compute volumes, stake out points, lines, alignments, planes, surfaces, complex roadways, side slopes, and catch points, as well as carry out as-built site measurements.

The Trimble Connected Community is a Web-based set of networking tools allowing greater communication between construction stakeholders. As part of the Trimble Connected Site portfolio of construction solutions, the system allows contractors to build information portals, share information and collaborate between head office management, site office teams, field crews, subcontractors, suppliers, engineers and clients on a project. System capability includes two-way data transfer and real-time communications to increase productivity for site positioning, grade control, asset management, and the Trimble Connected Community.

For site positioning systems, the system provides real-time, two-way data flow between the office and GPS or total station positioning systems.

For grade control systems real-time, two-way data is said to improve productivity using a system which creates an "live" link between the machines and the office. The live link enables contractors to rapidly send productivity using a system which creates a "live" link between the machines and the office. This solution allows the contractor to monitor and collaborate between head office management, site office teams, field crews, subcontractors, suppliers, engineers and clients on a project. System capability includes two-way data transfer and real-time communications to increase productivity for site positioning, grade control, asset management, and the Trimble Connected Community.

For site positioning systems, the system provides real-time, two-way data flow between the office and GPS or total station positioning systems.

The Trimble Construction Manager solution combines GPS and wireless communications to enable contractors to connect to their assets on heavy and highway projects. Using an Internet-enabled interface, the contractor can see the status of each piece of equipment on their construction sites, live in the office. This solution allows the contractor to monitor and report cycle times, delivery status, equipment productivity and utilization, machine run time and idle-time hours as well as fuel consumption to maximize their equipment fleet and improve their operations by lowering costs, improving project cost reporting and reducing project risk.

Introduced in April 2008, the Trimble GCS900 Grade Control System version 10.8 provides automatic blade control, configurable earthworks progress monitoring and blade guidance software. The new version is designed to allow earthworks operators to visualize, construct and balance road surfaces more accurately and faster, in higher gears. With version 10.8, the Trimble GCS900 has optimized automatic blade control settings for dozers. Working closely with multiple equipment manufacturers, Trimble has developed specialized interface settings that optimize hydraulic performance on the dozer when the Trimble GCS900 Grade Control System is automatically controlling the dozer blade. No additional sensors or hardware are required to achieve this level of automatic performance. This performance allows the operator to grade, not just simple pads and slopes, but complex design surfaces and alignments at faster speeds, without sacrificing grade control accuracy or quality of the final graded surface. The Trimble GCS900 version 10.8 on-machine software offers enhancements to the operator configurable software, including improved earthmoving progress information and configurable blade guidance options. Operators can grade to cut / fill and view maps representing the total earthmoving progress on the job site, generated from the Trimble SiteVision Office Productivity Module. These cut / fill maps are generated from productivity data collected from each machine equipped with Trimble GCS900 and represent the total earthworks progress on the job site. As machines work, the cut / fill maps are updated. The data can be transferred back to the office at the end of a shift, reprocessed and transferred back to the machines at the start of the next shift. Operators of all abilities can benefit from this new capability by immediately visualizing target areas that require further excavation to achieve design grade, anywhere on the jobsite. New custom guidance blade tip guidance options allow the operator to configure the system to suit the needs of any fine grade application and provide even more in-cab real-time guidance information for high accuracy grade control capability.

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