

ONE

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WINEFRED STATION ON THE INTER PIPELINE PROJECT

ABOVE:
NORTHEAST ANTHONY HENDAY DRIVE,
EDMONTON, ALBERTA

BACK COVER:
ATIKOKAN THERMAL GENERATING STATION,
ATIKOKAN, ONTARIO

This magazine includes certain forward-looking statements that contain information concerning possible or assumed future results or operations of Aecon. These forward-looking statements are based on current operating plans and competitive, financial and economic data but are subject to risks and uncertainties. Although Aecon believes the expectations reflected in these forward-looking statements are reasonable, it can give no assurance the expectations of any forward-looking statements will prove to be correct.



2014

**Best
Employers**
in Canada

By Aon Hewitt

AECON'S VISION:

To be the first company people go to for building things that matter.

ONE is a magazine published by Aecon Group Inc. for its employees and clients.

For more information about Aecon, visit our website at aecon.com.

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INTEGRATION, CONNECTION AND COLLABORATION THE ONE ROUTE TO SUCCESS

By Teri McKibbin
President and Chief Operating Officer



As Canada's largest publicly traded construction and development company, Aecon attracts a lot of attention from the investment community, not just from our shareholders, but also from business reporters, analysts and investment dealers looking for sound investments.

Our scale, diversification, record of growth, strong financial fundamentals and quarterly dividends make Aecon an attractive investment. As such, we spend a considerable amount of time and effort participating in investor conferences, marketing and tours, including recently with CIBC in Montreal, Raymond James in Edmonton and Dundee in New York.

Financial analysts are great at dissecting financial performance and analyzing the numbers, but numbers tell only part of the story. Seeing a company in action brings the numbers to life, and there is perhaps no better example of our "ONE Aecon" strategy at work than

the Northeast Anthony Henday Drive project site in Edmonton, which was recently toured by a few dozen investors.

Two years ago, we introduced "ONE Aecon" as the lens through which we focus all our activities. As infrastructure projects become bigger and more complex, the "ONE Aecon" approach pulls Aecon's considerable resources together under a single all-encompassing umbrella. It gives our clients a single point of contact, develops cost savings through economies of scale and opens up opportunities to develop new business. When we act like a large, national fully integrated services



**THE “ONE AECON” APPROACH PULLS AECON’S
CONSIDERABLE RESOURCES TOGETHER UNDER
A SINGLE, ALL-ENCOMPASSING UMBRELLA.**

company, we get to perform large, complex construction projects.

In July 2012, Alberta Transportation awarded Capital City Link General Partnership, a consortium in which Aecon is a construction partner, a \$1.8 billion contract to design, build, operate and partially finance the construction of the Anthony Henday Drive extension. This portion of what will ultimately be a ring road around Edmonton will see the construction of 27 kilometres of divided highway and 46 bridge structures – the largest highway project in Alberta to date. As we profile in this issue, Aecon is one of the construction partners on this enormous project and is tackling its complexity through the services of Aecon Transportation, Constructors and Utilities, each one bringing its own unique set of resources and expertise. This, of course, is of little concern or interest to Alberta Transportation. All the client wants – as is the case with so many of our clients – is a single, comprehensive and integrated construction consortium.

It’s not just the public sector that benefits from our “ONE Aecon” approach. In northern Saskatchewan, Aecon’s work on the AREVA uranium mill expansion, which involves civil

works, building construction and industrial services, brings to bear resources from across all three of our major segments

– Infrastructure, Energy and Mining – working collaboratively and providing the client with a seamless integrated team.

This issue also celebrates other notable projects. With more than 500 kilometres of pipeline and eight ancillary facilities, Inter Pipeline’s expansion north of Edmonton is Aecon’s biggest pipeline project to date. It also firmly establishes us as a major player in mainline pipeline construction at a time when the demand for new pipeline capacity in Western Canada is reaching a critical point. Meanwhile, in Saskatchewan, we’re completing work on Potash Corporation’s Rocanville mill expansion project, our largest mining project to date.

For someone like me who grew up in the road construction industry, perhaps the most intriguing project in this issue is the rapid bridge replacement job on Highway 417 in Ottawa. With rapid bridge replacement, a new bridge deck is built off-site and, in one extremely well-orchestrated event, the old bridge is demolished, a new deck is trundled into place and the new bridge reopened – all in a matter of hours. This was

Aecon’s first rapid bridge replacement project, and I am proud to say we set a new record for the fastest bridge replacement on record in Ontario.

With bridge replacement in the east, a biomass plant conversion in the north, highway construction in the west, pipeline construction in the oil sands and mining services on the prairies, Aecon is one of the largest and most diversified contractors in Canada. I think you will agree after you read this issue that, when it comes to building things that matter, Aecon is the One.

Teri McKibbin is the President and Chief Operating Officer of Aecon Group Inc.

PROJECT MATTERS

LAYING IT ON

THE INTER PIPELINE EXPANSION PROJECT

With more than 500 kilometres of pipeline and eight ancillary facilities, Inter Pipeline's network expansion north of Edmonton is Aecon's biggest pipeline project to date – and it couldn't have come at a more opportune time. Many of Canada's oil pipelines have now reached capacity, threatening to choke off surging production.

THE LINE

Even though pipelines are the cheapest, safest and least obtrusive way to transport petroleum, they have received more than their share of attention in the last few years. Proposals to build new lines, most notably the Keystone and Northern Gateway pipelines, have been dogged with uncertainty and delay. And yet, if there is one place that appreciates the numerous benefits of pipelines more than any other, it's Alberta. With the oil sands landlocked in the more northern reaches of the province, Alberta's oil producers rely on pipelines to get their product to market. The challenge, however, rests in keeping the process moving. With many of Canada's oil pipelines now "full," the lack of capacity challenges the flow of production.

In July 2012, Inter Pipeline, which operates some 6,300 kilometres of petroleum pipelines and transports roughly 40 per cent of oil sands production, announced it was planning to spend more than \$2 billion to expand its network. The project, which will ultimately add about 840 kilometres to the Cold Lake and Polaris pipelines, is slated to increase network capacity between oil sands-producing regions and market hubs by an additional 850,000 barrels per day.

Inter Pipeline's contractor-of-choice to get the project under way is Aecon, in a joint venture with Robert B. Somerville (SAJV).

"This is not the first time we've worked with Somerville," notes Mark Scherer, Senior Vice President of the SAJV. "Back in 2009, we had a joint venture to install three pumping stations

on the Alberta Clipper pipeline. It proved to be a good partnership. Somerville, with more than 50 years of pipeline construction experience, has the mainline construction expertise, and Aecon has the civil and industrial resources to complete all the ancillary work."

**INTER PIPELINE
WAS UNDER A LOT
OF PRESSURE TO GET
THIS JOB DONE AND
THEY NEEDED TO BE
SURE WHICHEVER
CONTRACTOR THEY
CHOSE HAD THE
RESOURCES TO DO
THE JOB.**

—MARK SCHERER
SENIOR VICE PRESIDENT
SAJV

Clearly, Inter Pipeline is of the same opinion.

"This wasn't a tendered project," notes Scherer. "Inter Pipeline was under a lot of pressure to get this job done and they needed to be sure whichever contractor they chose had the resources to do the job."

In July 2012, Inter Pipeline called the joint venture in for a meeting and ironed out the details for a \$600 million contract, which has since increased to \$800 million. The joint venture initiated work on the project three months later.





PROJECT FILE

The Inter Pipeline Expansion Project

LOCATION:

Alberta (from Edmonton and Hardisty to Fort McMurray)

SCOPE:

// 549 kilometres of crude oil pipeline
// 4 pumping stations and 4 ancillary facilities

CONTRACTOR:

SAJV, a 50/50 Aecon and Robert B. Somerville joint venture

AECON BUSINESS UNITS:

// Utilities (mainline pipeline, contract administration, joint venture board)
// Industrial West (structural steel, pipe fabrication, project management)
// Aecon Mining Construction Services (electrical, pipe fabrication)
// Buildings West (supply and erection facility buildings)
// Aecon Construction Management Inc. (civil services, concrete, piling)
// AGI Traffic Tech (electrical, grounding)

TIMING: October 2012–April 2016

CONTRACT VALUE: \$800 million

EMPLOYEES:

// 1,300 on pipeline (at peak)
// 500 on facility construction (at peak)

KEY EMPLOYEES:

Mark Scherer – Senior Vice President, SAJV
Andrew Geden – Vice President, SAJV
Nick de Koning – President, Robert B. Somerville
Joe Phillips – Project Manager
Lorne Drake – Project Superintendent
Ernie Ochocki – Project Superintendent
Rodger Magee – VP Operations, Robert B. Somerville
John Cunningham – Construction Manager, Facilities
Jett Janczak – Lead Project Manager, Facilities
Jack Cantwell – Project Administrator

SAFETY:

Employee hours without an LTI – 4 million to Nov. 2013

PIPELINE SCOPE

	PIPE SIZE (DIAMETER)	LENGTH
Winefred Extension	30"/16"	40 km
Kirby Lateral	16"/10"	20 km
La Corey to Hardisty – Spread 1	42"	120 km
La Corey to Hardisty – Spread 2	42"	120 km
Foster Creek to La Corey	36"	80 km
Polaris Flat Lake to Christina Lake	30"	80 km
Polaris Edmonton to Lamont	24"	45 km
Winefred to Narrows Lake	20"	54 km

IN THE TRENCHES

Beginning with two of the smaller pipelines – the Winefred Extension and Kirby Lateral – the joint venture set to work in November 2012. For some, launching a project like this so late in the season may seem counterintuitive. As anyone familiar with the Edmonton area can attest, winters can be harsh. In the unrelenting cold, with temperatures routinely plummeting to -30°C, metal gets brittle, oil thickens, fuel consumption dramatically increases and exposed skin can suffer frostbite in a matter of minutes. And yet, as Mark Scherer suggests, a little ingenuity from contractors can turn even freezing temperatures into an asset.

“When you’re working in areas of muskeg or where the water table is high, it’s not winter that is the most difficult season...it’s spring. When the frost melts, heavy equipment churns the ground into mud and that really bogs down the progress.

“In winter, the frozen ground is like concrete, and we can manoeuvre the heavy equipment without any problem. Rather than giving in to the weather, we turn it to our advantage. We use snow guns to build ice roads and heavy equipment to compress the soil and drive the frost deeper into the ground.”

Scherer’s approach-to-project proved accurate for the most part once put into practice; however, it wasn’t all smooth sailing. At the Winefred Junction, the water in one particularly swampy area was too warm to get the necessary frost penetration. The pipeline crew had to coat the pipe with three inches of concrete to provide negative buoyancy and protect the coating from scarring as it was winched through the trench. Struggling through the swamp slowed production but, by April 2013, the joint venture team had laid 60 kilometres of the twin lines required to complete the first two segments of the project.

After a short break for spring thaw, the team turned its attention to the largest phase of the project: 240 kilometres of 42-inch-diameter line from the Hardisty Terminal in the south to the La Corey Terminal near Cold Lake.

Project Manager Joe Phillips describes the building of a pipeline as being a very systematic process. After the owner’s advance crew has cleared the 20-metre-wide right-of-way, the joint venture team strips the topsoil and builds access roads along the line. The trenching crew then moves in to dig the trench, which typically measures about a metre and a half deep. While that’s under way, the stringing trucks deliver the 80-foot lengths of pipe (known in the industry as “joints”), each one weighing in the order of 10 tonnes.

“Ideally, you want to lay pipe across flat terrain. It makes the job a lot easier,” notes Phillips. “That’s not the case here, though. We have a lot of hill country to deal with, which means that we not only



A FEW MONTHS FROM NOW, NO ONE WILL EVER KNOW THAT THERE'S A MAJOR PIPELINE JUST A FEW FEET BELOW THE SURFACE.

—JOE PHILLIPS
PROJECT MANAGER

have to move a lot more dirt but also do a lot of pipe bending to fit the contour of the ground." Phillips explains that bending an 80-foot-long piece of pipe to meet a very precise bend is not just a matter of brute force. It's also a pretty exacting task. When there's a bend required for every joint along a single stretch, as there was on this job, it can be challenging.

The joints are welded together using automatic welding machines, and the pipe is lowered into the trench. After the tie-in crew completes the final welds, the trench is backfilled and the ground restored to its natural condition. "A few months from now,

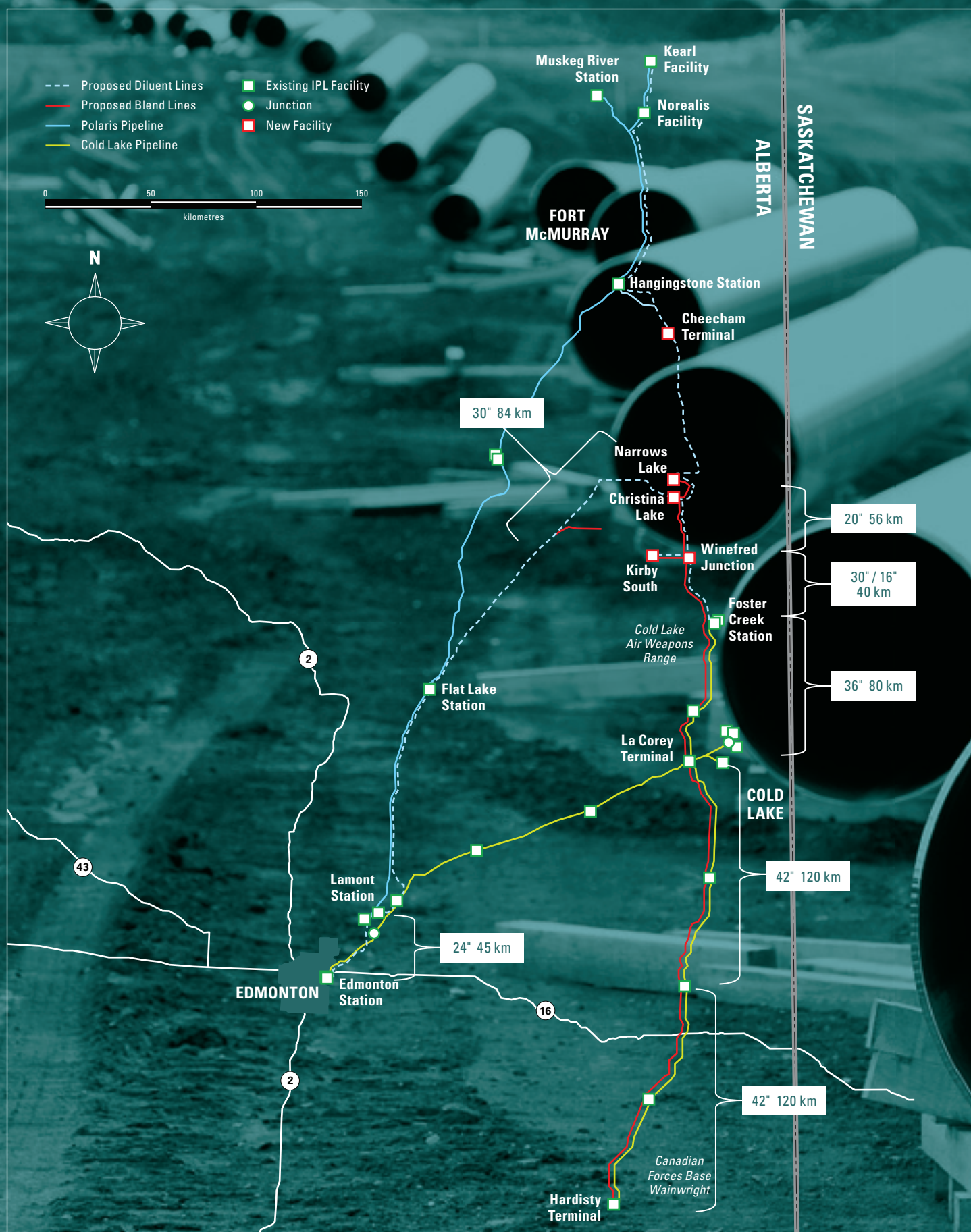
no one will ever know that there's a major pipeline just a few feet below the surface," concludes Phillips.

With more rain than anticipated, work on the mainline got off to a slow start. Production soon picked up, and the team began forging ahead at a rate of almost three kilometres a day, almost 50 per cent faster than outlined in the original schedule. By August, the northern segment of the pipeline had reached the North Saskatchewan River, a landmark that would prove to pose the biggest engineering challenge of all for the joint venture team.

"The river is about a kilometre wide, and the only way to get the pipeline across it is to go under the river," explains Phillips. "Some river crossings can be done using a cut-and-fill process, but we decided the best way was directional drilling."

It took Michels Canada Co. about two and a half months to bore a tunnel approximately two metres in diameter under the river. The line was then welded together on the north bank, and a large reamer was engaged to haul the line through the tunnel, resulting in a successful crossing for the team.

Heavy equipment and automatic welding systems aside, building a pipeline this size in such a short period of time is an extremely labour-intensive undertaking. At the peak of activity, more than 1,300 tradespeople can be at work on the line, most of them living in one of six camps set up along the right-of-way. Each camp offers a cafeteria, gym and recreation and entertainment facilities. Yet there's precious little downtime for





FACILITIES SCOPE

FACILITY	INSTALLATION
Kirby South Station	3 x 2000HP pumping station
Winefred Junction	Metering, testing and 4 pig traps
PX2-7 Expansion	2 metering stations, 1 km 16" pipeline
Foster Creek Phase 1	9 pig traps, 3 km 10" & 24" pipelines
Foster Creek Phase 2	4 x 2750HP pumping stations
Lamont Station	3 x 5750HP pumping stations
Edmonton Station	2 x 4500HP pumping stations
Christina Lake Station	3 x 4500HP pumping stations
Foster Creek FGH	2 x 1750HP pumping stations

workers. Most of the workers on the line put in 12-hour days, six days a week. It's hard work, says Phillips, but for those lucky enough to be hired on, it's also one of the best-paid jobs around.

The project team expects to complete the mainline before the end of the year. The next 160 kilometres of pipeline will be built over the winter months, with completion scheduled for April 2014. The entire line is slated for completion in 2016.

GETTING PUMPED

While pipelines operate for the most part smoothly and silently underground, there are a few additional above-ground facilities required to house the pumps, instrumentation and controls. In the case of the Inter Pipeline Expansion Project, about one-quarter of the contract is being invested in the construction of five pumping stations, three metering stations and a pig trap.

(Contrary to popular belief, a pig trap is not a refuge for wild hogs. Rather, pigs are pressure-driven pieces of equipment used to clean and inspect the pipeline.)

"One of the advantages the joint venture brings to this project is our ability to do almost every aspect of the facility construction and installation," notes Andrew Geden, SAJV Vice President and point person responsible for the facility installation. "The accelerated schedule called for the pumphouses to be built in six to eight months – about half the time that it would normally take. The only way this job could get done is if we did all the work ourselves, and that meant calling on the expertise of several Aecon business units."


In an integrated approach-to-project, Aecon Industrial West is leading one of the pump station sites and carrying out a portion of the pipe fabrication work, with additional fabrication coming from Aecon Mining Construction Services in Ontario.

The Buildings West team is supplying and erecting the prefabricated buildings; Aecon Construction Management Inc. is doing the concrete work and site services; and AGI Traffic is providing its electrical expertise.

The pumping stations are the heart of the whole system, notes Geden.

"These are massive pumps, weighing up to five tonnes each. The largest pumps at the Lamont Station are rated at 5,750 horsepower each, about 20 per cent more powerful than a typical locomotive. But installing the pumps takes enormous precision. Getting the pump and motor level is critical. If they are the slightest bit out of balance, the vibration intensity increases and the bearings on the rotating parts wear out much more quickly."

The entire assembly sits on four steel pads bolted to the concrete floor and, says Geden, it's absolutely critical to ensure the pads are level. "The pad-to-pad measurement cannot deviate from level by more than 0.001 inches per foot.



THESE ARE MASSIVE PUMPS, WEIGHING UP TO FIVE TONNES EACH. THE LARGEST PUMPS AT THE LAMONT STATION ARE RATED AT 5,750 HORSEPOWER EACH, ABOUT 20 PER CENT MORE POWERFUL THAN A TYPICAL LOCOMOTIVE.

—ANDREW GEDEN
SAJV VICE PRESIDENT



That means that our level has to be within 0.008 per cent." Once the pads are level, the crew sets a heavy steel base plate on top and, after a few fine adjustments, grouts the assembly into place. The pump and motor are then lifted into place and aligned with lasers, with steel shims used to make the final levelling adjustments. All in all, it takes about 10 days to level each plate and install the equipment, after which the crew completes the wiring and the piping.

Construction of the first pumping station started in November 2012 and was completed, along with two metering stations and one pig trap, by the end of the summer. The remaining facilities are slated for completion by the summer of 2014.

When facility construction hits its peak, there will be more than 500 tradespeople on-site.

SAFETY FIRST

With so many employees working on the project, safety is a top priority for the joint venture and for its client, Inter Pipeline Limited. In addition to Aecon's industry-leading Red Book safety training and procedures, all project workers are required to take part in a safety program led by Alkoomi, a UK-based management consultant firm. As of September 2013, the joint venture had completed 1.8 million employee-hours without a single lost time injury. A solid record for a fully integrated joint venture team.

PROJECT MATTERS

BRIDGING



A nighttime photograph of a highway bridge under construction. In the background, a yellow excavator is visible on the left, and a large pile of white material, possibly sand or gravel, is on the right. The bridge deck is illuminated by bright, circular work lights. A concrete barrier runs across the middle of the frame. Below the barrier, a blue construction vehicle is partially visible. The title 'THE GAP' is overlaid in large, white, sans-serif capital letters.

THE GAP

HIGHWAY 417 BRIDGE REHABILITATION AND RAPID BRIDGE REPLACEMENT

“Construction ahead ... Expect long delays.” Not the words a driver wants to see on an already hectic workday commute. A multi-lane highway, closed for bridge repairs, is reduced to a single row of bumper-to-bumper vehicles shuffling to work. Sipping on their morning coffee, those behind the wheel quickly realize precious time will be added to their daily drive. It could take months or even years before their commute returns to normal. It’s difficult to imagine a world without construction delays, but a state-of-the-art technique called rapid bridge replacement is actually eliminating years of traffic disruption by completing construction in a single night.

As the sun set on July 6, 2013, a team of 110 highly skilled men and women began work on Aecon's very first rapid bridge replacement project. Located in Ottawa near Kirkwood Avenue, two of the four 55-year-old bridges scheduled for replacement were about to be lifted from their holdings along Highway 417 (Queensway) in exchange for prebuilt bridges made of the most advanced construction materials. The entire procedure was expected to take as little as 16 hours. Sitting in bleachers erected a safe distance away, spectators watched incredulously as Aecon exceeded expectations by replacing both of the 400-tonne thin slab bridges in record-breaking time.

"We were told by the Ministry of Transportation of Ontario (MTO) that this project holds the fastest rapid bridge replacement time to date in Ontario," proudly notes John Almeida, Aecon General Manager, Transportation. "We completed the first two bridges at Kirkwood Avenue in 12 hours and broke the record when we replaced the second pair near Carling Avenue in 11 hours. That's five hours ahead of schedule."

To date, there have only been five "rapid replacements" carried out in Ontario, most taking an average of 16 hours to complete. It's a remarkable concept to compare one night's work

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—JOHN ALMEIDA
AECON GENERAL MANAGER,
TRANSPORTATION

with several years' work, which is what a more traditional method can demand when rehabilitating a bridge. In the case of the Ottawa project, where an estimated 136,000 vehicles travel across Highway 417's bridges on a daily basis, this kind of technology quickly translates into a commuter-friendly reality.

"Rapid bridge replacement eliminates having to close lanes for an extended period of time while a section is being rehabilitated," explains Gavin Anderson, Senior Project Coordinator. "This drastically reduces the burden to the travelling public. The public sees construction being completed around the bridge, but many residents don't even realize that they're driving on a new bridge after replacement."



4 THIN SLAB BRIDGES TO REPLACE, EACH WEIGHING

400 tonnes

110 HIGHLY SKILLED MEN AND WOMEN

136,000

VEHICLES TRAVEL ACROSS HIGHWAY 417 BRIDGES DAILY

PROJECT FILE

Highway 417 Bridge Rehabilitation
and Rapid Bridge Replacement

LOCATION:

Ottawa, Ontario

AECON DIVISION:

Aecon Construction and Materials Ltd.

CLIENT:

Ministry of Transportation of Ontario

TIMING:

Location One – July 6–7, 2013

Location Two – July 13–14, 2013

SCOPE:

// Rapid replacement and rehabilitation
of four 55-year-old bridges

// Widening of substructures to accommodate
an extra traffic lane

// Construction of four replacement bridges
in an adjacent laydown area

// Resurfacing of asphalt and site restoration

NUMBER OF EMPLOYEES: 110 (at peak)

KEY EMPLOYEES:

John Almeida – General Manager, Transportation

Gavin Anderson – Senior Project Coordinator

Jim Pillsworth – Project Superintendent





... YOU BETTER BE SURE THAT, ONCE YOU TAKE THE OLD ONE OUT AND PUT THE NEW ONE IN, YOUR GEOMETRY IS RIGHT. IT'S JUST AN INCREDIBLE EXERCISE IN SURVEYING.

—JOHN ALMEIDA, AECON GENERAL MANAGER, TRANSPORTATION

LONG-STANDING LEGACY

The four east- and westbound bridges, located at Kirkwood and Carling Avenues in Ottawa, were originally constructed in 1959. Almost a quarter-century later, in 1983, they underwent a full rehabilitation and, then, temporary repairs in 2002. Despite the ongoing repairs, it was apparent each of the bridge decks had exceeded its design life, through both man-made and natural cause deterioration.

With this knowledge, the Ministry of Transportation of Ontario cleared the required \$18 million rehabilitation contract in 2005. At that time, MTO also commissioned the widening of the substructures to accommodate four lanes instead of three, with each new lane built directly into the new bridges.

Priming the bridges for the big day was no small feat. The six months leading up to the rapid replacement involved non-stop planning and pre-rapid lift work. Every tool, man and piece of material had to be strategically managed throughout the job site.

"This is all about planning," says Almeida. "The level of detail is unbelievable. You need to be sure that what you're building, and where it's

going during the rapid lift, is going to fit. You're building a new bridge a couple hundred metres away from where it's supposed to go, so you better be sure that, once you take the old one out and put the new one in, your geometry is right. It's just an incredible exercise in surveying."

Extensive pre-rapid lift work involved the project team first excavating behind the ballast walls and making a series of cuts to temporarily disconnect the ballast from the deteriorating bridges. To accommodate the wider decks, the substructure was also rehabilitated and refaced, while, at a nearby assembly yard, the new bridges were readied on temporary support structures. Unlike traditional bridge construction where the structure is built piece by piece – and therefore less desirable due to the propensity for deterioration – bridge decks used in rapid replacement are formed as a solid mass. This eliminates some of the common drawbacks of traditional construction, such as cracking and ravelling.

The secret behind rapid replacement technology rests in the use of highly technical pieces of machinery called self-propelled modular transporters



6 months

LEAD-UP TO THE RAPID REPLACEMENT

11 hours

TO COMPLETE RECORD BRIDGE DEPLOYMENT



I CERTAINLY SEE (THIS) TECHNIQUE BECOMING MORE AND MORE POPULAR IN THE INDUSTRY. THE COST AND TIME SAVINGS BENEFITS ARE HUGE ...

—GAVIN ANDERSON
SENIOR PROJECT COORDINATOR

(SPMT). SPMTs resemble a long platform with numerous individually controlled wheels that help to evenly distribute the weight. Their length can be tailored to match the specifics of any job. The proportions for this particular project called for measurements of roughly six cars in length, with 10 sets of wheels. Instead of a crane, several SPMTs are used to carry different bridge decks during the course of a rapid lift. Almeida says without these heavy lifters, rapid bridge replacement would be impossible.

During the Kirkwood Avenue replacement, three SPMTs were used to get the bridge decks into position. Two SPMTs were positioned under separate bridges slated for removal and carefully lifted them from their highway location, transporting them to temporary support structures. In the assembly yard, the

third SPMT lifted one of the new bridges and travelled to the project site. Leaving only a small space the size of a pencil on either side, the third SPMT gently lowers the bridge into place. The first SPMT dropped its old bridge off in the assembly yard and then took the remaining new bridge to fill the final gap in the highway. To finish it off, the second SPMT unloaded its old piece onto the unoccupied supports.

With the replacement phase concluded, construction crews replaced the concrete approach slabs, resurfaced the asphalt and completed site restoration.

The new bridges are expected to last 75 years. As for the old bridges, they've been completely recycled. The demolition subcontractor, Demolition Plus, cut them into large sections and a 300-tonne crane helped to lower the

newly cut pieces to the ground. The concrete was then crushed and will be reused as stone, while the steel was sorted and sent to a recycling plant.

All in all, the rapid bridge replacement project was an overwhelming success, both in terms of project schedule and execution. Looking ahead, Gavin Anderson sees nothing but potential for this new technology when it comes to future bridge rehabilitation projects.

"I certainly see the technique becoming more and more popular in the industry. The cost and time savings benefits are huge, and in today's mindset, where MTO regards the public as clients, I personally believe this method will be used wherever and whenever possible."

LEGALLY GOLD



Against an international slate of heady competition, Aecon's in-house legal department brings home the gold and affirms its status among the best and brightest legal minds in Canada.

For the last seven years, Leaders League, a Paris-based media group specializing in strategy, finance and law, has hosted the International Legal Alliance Summit & Awards (ILASA). The much anticipated annual event pays tribute to the best in-house corporate law departments and independent law firms around the globe. This year, against the backdrop of several heavyweight contenders from more than 40 countries, the Aecon in-house legal team walked away with the coveted Gold Award for Best Canadian Legal Department.

"It's really gratifying to be recognized by your peers as having a first-rate legal department and being among the best in the business," notes Brian Swartz, Aecon Executive Vice President, Legal and Commercial Services and Chief Legal Officer. A 16-year company veteran,

Swartz says his team was pleasantly surprised to learn of the win, especially considering the stiff competition from such venerable institutions as the Royal Bank of Canada, Suncor Energy and the Canadian Imperial Bank of Commerce.

Accepting the award on behalf of Aecon was Yonni Fushman, Vice President, Legal and Assistant General Counsel, who travelled to New York City in June 2013 to attend the official ceremony.

"To have seven general counsel judges review us and say that, based on qualitative measures, we're doing it better than others, is very validating," notes Fushman. "There's been a tremendous amount of effort to grow our team the way we have, and to receive external validation from the industry is really meaningful."

And grow they have. Since 1998, the Aecon legal department has steadfastly

evolved into a comprehensive in-house legal group with a firmly entrenched commercial focus, including the coordination of Aecon business acquisitions over the years. Today, the team consists of nine lawyers, two engineers, a contracts specialist, an insurance risk manager and several administrative staff members. Together, they provide legal support to all Aecon business units across a wide range of areas: risk evaluation, contract review, Project Review Committee (PRC) coordination, litigation/claims support, labour and employment law, and public company and securities law.

The significant growth trend mirrors the evolution of Aecon as a company, which now posts \$3 billion in annual revenue and has seen a significant change in risk profile.



TOP ROW, LEFT TO RIGHT: Charles Todd, Colin Sam, Hugh Loughborough, Brian Swartz, Yonni Fushman, Niguel Mousseau, Ernie Chan, Adam Swartz;
BOTTOM ROW, LEFT TO RIGHT: Colleen O'Neill, Marilia Brown, Louise Smyth-Kaiser, Rebecca Murphy, Melanie MacFarlane, Martina Nikolic Doyle,
Patricia Skringer, Gabriella Kinda-Zoretic, Elisa Watson, Gilda Bastias Villagran; ABSENT: Corey Sandquist

TO HAVE SEVEN GENERAL COUNSEL JUDGES REVIEW US AND SAY THAT, BASED ON QUALITATIVE MEASURES, WE'RE DOING IT BETTER THAN OTHERS, IS VERY VALIDATING.

—YONNI FUSHMAN, VICE PRESIDENT
LEGAL AND ASSISTANT GENERAL COUNSEL

"Five years ago, less than 10 per cent of our projects were valued at over \$100 million," notes Swartz. "Today, not only are 40 per cent of our projects over the \$100 million mark, they're also substantially more complex in nature."

Indeed, the face of construction has changed dramatically over the last decade. What used to be considered a "sandbox" filled with familiar construction companies has now become a market teeming with international competition.

"The model has definitely been disrupted," says Fushman. "There has been a significant increase in project complexity, often involving joint ventures and public-private partnerships. As the industry evolves, we're finding ourselves in markets – like renewables – that didn't exist a few years ago."

To ensure the legal team remains in step with both market growth and

complexity, the group continues to refine its tools, resources and networks to fully understand the risks involved when dealing with, and negotiating, contracts. In partnership with Aecon University, the team has also been contributing curriculum development to support the company's focus on best practices in project contracts and has developed a set of guidelines for negotiating cost-plus contracts.

A shining example of the "value-added proposition" of the Aecon Legal and Commercial Group, notes Hugh Loughborough, Vice President of Contracts and Risk, is evidenced in the coordinated team effort that supported the bidding, negotiating and subsequent executing of Aecon's Darlington Retube and Feeder Replacement (RFR) Project. "Several members of our group were dedicated to the RFR Project Bid Team. In fact, one of our group members was

even seconded to the project team permanently. It's been an incredible journey ... and with great rewards. In 2011, the RFR team won an Aecon Outstanding Achievement Award for Extraordinary Team Achievement."

Moving forward, the legal team's focus is squarely aimed on assisting Aecon and its 12,000 employees in securing work, executing that work profitably and, at the end of the day, receiving payment for the quality work performed. Throughout all, notes Swartz, the legal team will remain committed to identifying the risks involved and presenting sound options for risk mitigation, risk management and risk transfer.

"It's what sets us apart," he says, "and what keeps us driven."



PROJECT MATTERS

Closing *the* LOOP



NORTHEAST ANTHONY HENDAY DRIVE

At \$1.81 billion, the Northeast Anthony Henday Drive (NEAHD) project represents the single largest highway construction project in Alberta to date. With construction well under way, Aecon and its joint venture partners are focused on literally closing the loop on Canada's first free-flowing ring road, offering Edmonton drivers a whole new meaning to "round trip."

THE FACT THAT THIS IS THE LARGEST CONTRACT ALBERTA TRANSPORTATION HAS EVER TENDERED IN ITS HISTORY GIVES AN IDEA OF HOW BIG THIS PROJECT REALLY IS, WHICH IS WHY WE HAVE THREE OTHER PARTNERS WORKING ON IT WITH US.

— GREG STEELS
AECON VICE PRESIDENT *of* INFRASTRUCTURE OPERATIONS

Like the early European explorer for which it is named, Anthony Henday Drive (Highway 216) in Edmonton has been forging its way forward, bit by bit, since the Alberta government first developed plans for a ring road in the 1970s, some 200 years after Henday's own footprint landed in the area. And, much like Henday the explorer would have secured his path forward with a compass in hand, construction of his namesake highway has taken place in distinct phases based on the compass' four cardinal directions.

First up was the western leg, built by the City of Edmonton during the 1990s. Soon thereafter, the provincial government took the roadway under its wing. In 2006, the southwestern section was completed, followed by the southeastern in 2007, under a public-private partnership (P3) framework. The northern section of the highway had been largely addressed through a separate project, leaving the next major construction section to be the 21-kilometre northwestern stretch. At more than \$1 billion, it represented a substantial P3 contract, and work got

under way in 2008, wrapping up three years later in 2011.

Today, some 69 kilometres of Anthony Henday Drive is currently in service, constituting approximately two-thirds of what is slated to become the first free-flowing ring road in Canada. That is, once Aecon and its joint venture partners complete the final northeastern section.

SCOPE OF WORK

The Northeast Anthony Henday Drive (NEAHD) project is a monster undertaking. As its name specifies, this portion of road stretches just northeast of the city's core, beginning at Manning Drive and extending south to Whitemud Drive. The project calls for 27 kilometres of six- and eight-lane divided roadway, which, when translated into single-lane road measurements, equals 160 kilometres. Scope of work also includes nine interchanges, 47 total bridge structures (two of which cross the North Saskatchewan River) and 523 "utility conflicts" that require varying degrees of attention before commuters can hit the road.





PROJECT FILE

Northeast Anthony Henday Drive (NEAHD) Project

LOCATION:

Edmonton, Alberta

CLIENT:

Alberta Transportation

DEVELOPER:

The Capital City Link General Partnership
(Meridiam, Hochtief, ACS)

JOINT VENTURE:

Flatiron-Dragados-Aecon-Lafarge (FDAL)

AECON BUSINESS GROUPS:

// Transportation
// Utilities
// Constructors
// Project timing: July 2012 – Fall 2016
// Contract value: \$1.81 billion

SCOPE:

// 27 kilometres of six- and eight-lane divided roadway
(equivalent to 160 single-lane kilometres)
// 9 interchanges
// 2 road flyovers
// 8 rail crossing flyovers
// 2 bridges, spanning the North Saskatchewan River
// 47 bridge structures, in total

EMPLOYEES (AT PEAK):

500 Joint Venture Team; 11 Aecon Supervisors

KEY EMPLOYEES:

Sami Abunaaaj – Roadway Construction Manager
Kent Payton – Project Manager
Jose Perez – Deputy Project Manager
Rob Richardson – Structures Manager
Graham Wilson – Utilities Coordinator
Jeff Peroff – Pipeline Utilities
Corey Hall – Roadway Cost/Scheduling Engineer
Gary Hodge – Safety Manager

AECON BOARD MEMBERS:

Mark Rivett, EVP, Infrastructure
Don Brophy, SVP, Aecon Constructors
Greg Steels, VP, Infrastructure Operations

47 TOTAL BRIDGE STRUCTURES

523 "UTILITY CONFLICTS" TO ADDRESS

14 million
CUBIC METRES OF ESTIMATED EARTHWORKS



Greg Steels, Aecon Vice President of Infrastructure Operations, is well aware of the magnitude of this joint venture project and its vaulted status as the provincial government's largest-dollar contract for new road construction.

"The fact that this is the largest contract Alberta Transportation has ever tendered in its history gives an idea of how big this project really is," he notes, "which is why we have three other partners working on it with us."

Officially announced by Alberta Transportation in May 2012 following the request for proposal (RFP) process, the NEAHD project was awarded to the Capital City Link General Partnership, which signed a 34-year, public-private partnership (P3) contract to design, build, operate and partially finance the project. In turn, the design and

construction portions of the project were subcontracted to an integrated joint venture between Aecon Construction Management Inc., Flatiron Constructors Canada Limited, Dragados Canada Inc. and Lafarge Canada Inc. Operations and maintenance of the project were subcontracted to Volker Stevin Highways Ltd.

In making the award announcement, the provincial government also cited notable benefits of the P3 delivery framework over a traditional delivery model, namely more than \$370 million in savings and up to three years saved in construction time. The project is expected to be completed by Fall 2016.

PAVING THE WAY

Known as a ring road, Anthony Henday Drive diverts heavy traffic each day from

the city's core by connecting the roads that encircle Edmonton, effectively reducing both traffic congestion and commute times. More than 50,000 motorists use the highway on a daily basis, which is expected to increase once the road comes "full circle."

With 27 kilometres of road still to be built, a stark contrast is evident between the types of roadwork under way. No longer meeting Alberta Transportation's standards, 18 kilometres of pre-existing road between Highway 16 and Whitemud Drive is considered a "brownfield" project and will be reconstructed to accommodate the eventual increase in traffic volume.

Conversely, the final nine kilometres travelling north from Highway 16 to Manning Drive has been labelled a "greenfield" project and offers the joint venture team a clean canvas to work with



as they grade and pave their way across the landscape – weather permitting, of course.

As can happen in Alberta, weeks of non-stop rainfall during Edmonton's spring season carried over into the summer months, saturating the site's predominantly clay soil. With more than one million tonnes of asphalt to place, roadway construction was significantly slowed, subsequently pushing the joint venture's paving schedule into the next three years.

"Every second counts when you're keeping up with a tight schedule," notes Steels, "but next year we'll start paving in earnest and make up for lost time." With an estimated two million tonnes of granular base course and one million tonnes of asphalt required to be laid in place over the next three years, Steels

says it's definitely going to be a challenge. "As long as our asphalt plants provide us with a stable supply of mix, we're up to the task."

To date, Lafarge has been supplying the asphalt from local stationary plants. As the paving ramps up in 2014, Aecon's South Rock group will mobilize its portable asphalt plants to key job site locations to supplement Lafarge's production.

Thankfully, the weather began improving by late summer and earthworks production shifted into high gear. On average, the joint venture team loads, hauls and places approximately 22,000 cubic metres of earth per day, an impressive volume by anyone's daily standard and yet diminutive when compared to the whopping 14 million cubic metres of estimated earthworks to be completed by project's end. If the

weather continues to hold, Steels says the joint venture aims to finish the majority of the earthworks by the end of 2014.

OVERCOMING THE ODDS

As any site team will quickly attest, battling the elements is just part of the package when working outdoors on a job. That said, elements of a non-weather variety are another story.

During the design phase of the NEAHD project, it was discovered the construction zone was actually located on numerous utility corridors. All told, the tally came to 523 major and minor utility "conflicts," making this enormous project even bigger. Approximately 100 of these conflicts were deemed in need of immediate attention in order to keep the schedule from lagging behind.

OUR PROJECT
TEAM HAS A LOT
OF EXPERIENCE
BEHIND THEM, AND
THEY'VE BEEN DOING
A FANTASTIC JOB
OVERCOMING THE
OBSTACLES A PROJECT
THIS SIZE POSES.

—GREG STEELS
AECON VICE PRESIDENT *of*
INFRASTRUCTURE OPERATIONS



"When doing this kind of project, the most critical utilities are the pipelines, such as natural gas and oil, which can interfere with a bridge's foundation or a structure's alignment," explains Steels, adding that obtaining permission and permits from the owner to relocate or protect these pipelines "in place" can take a tremendous amount of time and effort. "In some cases, we've had to adjust our work areas and implement various workarounds because the approvals were taking so long."

On the NEAHD project, some of the pipelines are estimated to be over 30 years old and require integrity tests. Once assessed, pipelines are either relocated or protected in place. The latter is achieved either by placing the utilities inside a casing pipe, which will bear the weight of anything constructed above them, or by pouring a concrete slab over top to shield and transfer the weight away from the utilities.

Steels is quick to add this is not always a straightforward process since utility owners have specific requirements that must be met and will often send their own trusted contractors to complete the work. The benefit that Aecon, as a joint venture partner, offers on this type of project deliverable is the expertise of the Aecon Utilities group, which has been granted permission to address a significant portion of the identified conflicts. Steels has one word when characterizing this "ONE Aecon" collaboration: invaluable.

"Having them perform such crucial work on a project of this magnitude makes a world of difference. It means we're all in the loop, everything's transparent and there's a degree of control for us over the work being done, which helps us stay on track with our schedule."

CROSSING THE TERRAIN

Of the 47 bridge structures required for this project, the two most important superstructures will extend across one of Canada's Heritage Rivers, the North Saskatchewan River. The river runs diagonally through the middle of Edmonton's core and flows eastward to cross paths with the NEAHD project site. Crossing the river requires two separate four-span bridges, each stretching 300 metres. The first phase of this two-phased construction job involved the installation of a cofferdam on the south riverbank. Four piers, two for each bridge, were erected from the riverbed. The piers form two-thirds of the bridge's support. After the south cofferdam was removed in October, work began almost immediately on the north riverbank. Another cofferdam was built up in November, and work on the final two piers was under way. Once in service, the bridges will give Albertans a distinct vantage point of the river and its surroundings.

Building the other 45 bridges over and around the landscape will require work to progress through the winter months. A year and a half into the project, the

joint venture team anticipates the substructures, girders and deck forming will be accomplished on 16 structures over the next few months. By May 2014, the team is aiming to have upwards of 25 structures ready for deck pours through August 2014. This will go a long way toward the team's ultimate focus of completing all bridge work before the 2016 construction season. Reaching that project milestone will offer them the opportunity to solely concentrate on road work in their final project year.

Although a seasonal drop in temperature curtailed 16 deck pours that the joint venture team was optimistically hoping to achieve this year and pushed them into April 2014, the wheels didn't stop turning. Pile driving and pouring concrete footings for several more bridges will continue throughout the winter season, preparing the team for spring. If all goes well, the joint venture will have roughly eight more bridges ready to go for April, bringing the potential number of completed bridges up to 25 before the end of 2014.

"Our project team has a lot of experience behind them, and they've been doing a fantastic job overcoming the obstacles a project this size poses," says Steels of the work to date. "We have a tight schedule moving forward, but we're definitely on track and looking forward to completing this job on time and on budget."



PROJECT MATTERS

Fertile

ROCANVILLE PROCESS MILL INSTALLATION

After impressing PotashCorp on the Picadilly Mine Project in New Brunswick, Aecon Mining Construction Services was awarded its single largest mining contract to date and promptly followed its client west to Saskatchewan. Two years later, the Aecon team is wrapping up work on a world-class processing facility that will help the potash giant meet its global demand.

Ground

A low-angle, upward-looking photograph of industrial structures. On the left, a building with white and red vertical stripes is visible. A large, dark brown horizontal beam spans across the middle of the frame. Below it, a complex network of yellow metal structural beams and supports is visible. The background is a clear blue sky with some light, wispy clouds. The overall composition creates a sense of height and industrial scale.

Anyone familiar with Rocanville, Saskatchewan, will instantly recognize the signature red and white vertical stripes that adorn PotashCorp's mine site buildings east of town. For 40 years, PotashCorp has been extracting and processing potash, phosphate and nitrogen for a global market that heavily relies on these fertilizer products to keep farmland soil healthy and productive. Today, the company has put the town on the map as the world's largest producer of both potash and fertilizer and the third-largest producer of nitrogen and phosphate. From a global market perspective, PotashCorp serves nearly three-quarters of the world's population and roughly 80 per cent of the world's total fertilizer consumption.

Supplying so much of the world's potash production from its Canadian operations has translated into substantial growth for the company's mining facilities in Rocanville, located some 230 kilometres east of the provincial capital. With an estimated 53 per cent of the world's potash reserves hidden deep below the Earth's surface in this region, PotashCorp announced plans in 2007 to enhance its ability to bring it to market by increasing annual production to 15.7 million tonnes.

In December 2011, the multi-million-dollar contract to install the interior of a new process mill was awarded to Aecon Mining Construction Services, representing the largest, single, self-

WITHOUT A DOUBT, BEING AWARDED AND ENTRUSTED WITH THIS SIZE OF A CONTRACT BY POTASHCORP HAD A LOT TO DO WITH OUR STRONG OPERATIONAL AND SAFETY PERFORMANCE ON THE PICADILLY PROJECT.

— PHIL WARD
EXECUTIVE VICE PRESIDENT
AECON MINING

perform mining contract ever awarded to Aecon. Initially a combined firm-price/cost-reimbursable contract, Aecon renegotiated it into a fully firm-price contract in April 2013.

"Without a doubt, being awarded and entrusted with this size of a contract by PotashCorp had a lot to do with our strong operational and safety performance on the Picadilly project," notes Phil Ward, Executive Vice President, Aecon Mining. "We developed a great working relationship with the client and AMEC, the engineering firm, on that job, and we're thrilled to be working with them again."





PROJECT FILE

Rocanville Process Mill Installation

CLIENTS:

Potash Corporation of Saskatchewan (PCS),
AMEC

AECON GROUP:

Aecon Mining Construction Services

PROJECT TIMING:

April 2012 – December 2013

TYPE OF CONTRACT: Fixed-price

INITIAL CONTRACT VALUE: \$250 million (approx.)

SUMMARIZED SCOPE:

- // Installation of all customer-provided equipment
- // Installation of all piping, electrical utilities and fire protection
- // Complete electrical process systems, including power, control and instrumentation tray, wiring and devices, PLC, communications and fire detection
- // Process piping systems
- // Mechanical
- // Instrumentation installation and calibration
- // HVAC and dust collection systems
- // Insulation
- // Fireproofing and firestopping
- // Lightning protection system
- // Communication network and VOIP phone system
- // Architectural


QUANTITIES:

- // 366,000 metres of electrical wiring (power and control cabling)
- // 34,750 metres of piping
- // 14,000 metres of electrical trays and off-tray

AECON EMPLOYEES: 750 (at peak)

KEY EMPLOYEES:

- // John Salter, Vice President, Aecon Mining and Construction Services
- // Roger Archambault, Senior Project Manager
- // Carl Baron, Project Manager
- // Craig Cook, Project Manager
- // Graeme Morris, Assistant Project Manager
- // Harvey Seymour, Construction Manager
- // Jason Prince, Site Safety Manager
- // Tom Foley, Site QA/QC Manager



BRINGING OVER 700 WORKERS FROM ALL ACROSS THE COUNTRY TRANSLATES INTO A LOT OF DIVERSITY WHEN IT COMES TO SAFETY CULTURE ... EVERYONE HAD TO BE TRAINED AND EDUCATED ON AECON'S SAFETY PRACTICES TO ENSURE WE WERE ALL ON THE SAME PAGE.

—JASON PRINCE, SITE SAFETY MANAGER

A JOB LIKE NO OTHER

In April 2012, Aecon first mobilized on-site and began working on the new mill installation that would be processing the ore from PotashCorp's nearby mine. Scope of work involved the installation of all utilities and equipment for the new facility, including process piping, electrical, mechanical, instrumentation and HVAC. Client-provided equipment for the expansion included conveyors, dryers, compactors, tanks, pumps, flotation, cyclones, screens, ESPs, mills, MCCs, switch gears, a transformer and VFD panels.

The Rocanville Mill differs in a major way from most mining operations in that, unlike a traditional mill which is typically spread out horizontally, this mill is constructed vertically, standing just over 60 metres tall with eight operational floors.

"For sure the vertical nature of this mill presented us with huge logistical challenges," says John Salter, Vice President, Aecon Mining and Construction Services, stressing the importance of careful planning and coordination on such a large-scale job. "With all the different levels on this job, we found the biggest challenge was

just trying to execute the work around a congestion of workers on the same level at the same time. Scheduling, delivering and manoeuvring the equipment, materials and supplies were a feat in itself, not to mention the logistics and processes needed for safe work execution."

Labour was another challenge, as is often the case when undertaking major projects in smaller communities and remote regions. With 750 workers required for this job, the Rocanville project was no exception, especially with Aecon self-performing the majority of the



work. Some 75 key, experienced managers and supervisors were brought on site to oversee the project, but the challenge of ramping up with skilled tradespeople proved onerous.

"As you can imagine, a project of this size quickly depletes all resources from the local union halls in southern Saskatchewan," says Roger Archambault, Senior Project Manager. "As a matter of fact, only 25 per cent of the required labour came from local halls. The remaining balance came from journeymen who were flown in on travel cards from all across the country."

Overall, Aecon self-performed 90 per cent of the work scope, while subcontracting 10 per cent for such deliverables as HVAC, painting, scaffolding, insulation and pneumatic instrumentation.

Ensuring the work was safely executed was high on the priority list. When asked how difficult it was to implement Aecon's Safety First culture on site, Jason Prince, Site Safety Manager, admits it was a challenge in the beginning. "Bringing over 700 workers from all across the country translates into a lot of diversity when it comes to safety culture. We had all sorts

of trades on site at the same time – pipefitters, electricians, ironworkers, millwrights, boilermakers, operating engineers and sheet metal workers. Everyone had to be trained and educated on Aecon's safety practices to ensure we were all on the same page."

Within six months of project start, a steady improvement in safety results was noted, yet those numbers still proved to be unacceptable for Aecon's stringent safety standards. In October 2012, a safety "refocus" plan was introduced on the Rocanville site calling for greater frequency of proactive leading

// FERTILE GROUND

3.2 million

MAN HOURS ON THE ROCANVILLE PROJECT

0

LOST TIME INJURIES





indicator activities by frontline supervision. Safety audits performed by the safety department were also increased and utilized for knowledge sharing to help enhance safety performance. Collectively, these actions enabled supervisors to develop an on-site safety culture that fostered exceedingly positive results. Overall, Aecon successfully executed more than 3.2 million man-hours on the Rocanville project without a Lost Time Injury, and reduced the overall Non-Lost Time Injury frequency by 51 per cent.

Creating a safe work environment also translates into a productive work environment. As a result, the project has ultimately tracked on schedule and within budget. Completion and pre-commissioning of what is referred to as the “dry” side of the mill took place in August 2013, while all mechanical work for the “wet” side is slated for completion by the end of 2013.

HAVING BUILT A SOLID REPUTATION FOR EXECUTING MAJOR MINING CONSTRUCTION PROJECTS LIKE THIS ONE, WE ARE IN A GOOD POSITION TO BRING THE WHOLE WEIGHT OF AECON’S SERVICE OFFERING TO THIS MARKET.

— PHIL WARD
EXECUTIVE VICE PRESIDENT, AECON MINING

Phil Ward says once it’s fully operational, the Rocanville Mine will be one of the largest potash processing sites in the world, and that, he notes, can help open a lot of doors for Aecon in future full-scale mining contracts.

“Having built a solid reputation for executing major mining construction projects like this one, we are in a good position to bring the whole weight of Aecon’s service offering to this market,”

says Ward. “We can provide a ‘one-stop shop’ for our clients that includes foundation work, building construction, utilities, complete site and civil works... the list goes on,” notes Ward. “With all of Aecon behind us, we are quickly becoming a premier player in the mining industry.”

Meeting DEMAND

AREVA McCLEAN LAKE MILL EXPANSION

Far below the quiet reflection of northern Saskatchewan's lakes lies a treasure trove of high-grade uranium, capable of producing 2.7 million times as much energy as its equivalent weight in coal. Helping it get to market is the collective work of "ONE Aecon" in a multi-million-dollar expansion to the AREVA uranium mill that, once completed, will almost double its processing capacity.



High-grade uranium (U_3O_8), a key component in nuclear energy production, exists in such great quantity in this remote northern pocket of Saskatchewan that it's put the province on the map as a leading global source for this silvery-black metallic compound. An estimated 17 per cent of the world's uranium ore production is generated in this region, surpassed only by the country of Kazakhstan, at 36.5 per cent. Extracting and processing it have become big business here, and the rush to ensure supply meets global demand means expansion on all fronts.

Leading the charge to market is AREVA Resources Canada, a leading supplier of solutions for low-carbon power generation, with expertise in every step of nuclear power generation. In Canada, that expertise is focused on uranium mining, nuclear services and nuclear measurement equipment through AREVA Resources Canada.

In May 2013, Aecon was selected as general contractor to help AREVA keep up with the global demand by fulfilling a multi-million-dollar contract to execute all construction work related to a major expansion of its McClean Lake Mill. Once completed, the mill will significantly increase its capacity to process uranium ore gathered from several of AREVA's joint venture mining operations in the area, including Cigar Lake, the world's second-largest high-grade uranium mine.

IT TAKES ONE SEMI-TRAILER TRUCK THAT'S PACKED WITH AS MUCH MATERIAL AND SUPPLY AS POSSIBLE 14 HOURS TO TRAVEL ONE WAY TO OUR SITE.

—RON CHORNEY
SENIOR PROJECT MANAGER

Some 75 per cent of the increased capacity will be dedicated to processing Cigar Lake's uranium ore, while the remaining capacity will be reserved for processing ore from other sources.

The McClean Lake Mill is the only facility in the world capable of processing high-grade uranium ore without dilution. This means ore with high levels of radiation no longer needs to be mixed with low-grade ore. Radiation protection has been built into the construction of the facility, such as the use of concrete vaults to house the process tanks and lead shielding used for the piping, which offers the requisite radiation protection for facility workers and allows the mill to process a much higher grade of uranium.





PROJECT FILE

AREVA McClean Lake Mill Expansion

LOCATION:

McClean Lake, Saskatchewan

CLIENT:

AREVA Resources Canada

AECON GROUPS:

Mining – Aecon Mining
Infrastructure – Buildings West
Energy – Industrial Western

PROJECT TIMING:

June 2013–January 2016

TYPE OF CONTRACT:

Reimbursable, based on target

SUMMARIZED SCOPE:

// Increase annual uranium (U_3O_8) production capacity at McClean Lake Mill to 22 million pounds from 12 million pounds
// Installation and modification of new and existing equipment in 16 areas of the facility

QUANTITIES:

// Earthworks/excavation – 16,058 cubic metres
// Concrete placement – 3,823 cubic metres
// New buildings/expansions – 23,000 square feet
// Structural steel – 1,000 tonnes
// Piping – 21,000 feet
// Electrical cable – 312,000 feet
// Process equipment – 200 pieces
// Instruments – 700 pieces

AECON EMPLOYEES: 100 (at peak)

KEY EMPLOYEES:

Ron Chorney, Senior Project Manager (Off Site)
Glenn Larson, Senior Construction Manager (On Site)
Ron Campbell, Civil Project Manager
Jack Vermette, Project Manager
Lazar Damjanovic, Assistant Project Manager



PHOTO COURTESY OF AREVA RESOURCES CANADA

In a stellar example of the “ONE Aecon” approach at work, the McClean Lake Mill project is benefiting from the confluence of Aecon’s three main business segments, each one bringing to the site core-competency expertise in pursuit of the project’s overall expansion goals. On-site mobilization began in June 2013 with Aecon Mining in charge of grading the job site and laying concrete. Aecon Infrastructure’s Buildings team has been overseeing all building construction, and Aecon Energy’s Industrial Western group is performing the structural, mechanical, piping and electrical work.

MAKING ROOM FOR GROWTH

Almost doubling the processing capacity at the McClean Lake Mill means scope of work on this job is substantial. Sixteen separate areas require attention in relation to equipment upgrades, relocations and new installations. Aecon’s Buildings and Energy groups kicked off their expansion

work last summer with construction in the electrical supply and distribution area, a solvent extraction plant (SX-2) and a yellowcake (processed uranium) storage building.

Conducting this type of on-site work is second nature to Aecon project teams, yet doing so in a highly remote region of the country poses unique challenges. Getting equipment to the site and securing a steady materials supply chain have already proved to be formidable.

“It takes one semi-trailer truck that’s packed with as much material and supply as possible 14 hours to travel one way to our site,” explains Senior Project Manager Ron Chorney. “The truck hauls everything from structural steel to tanks and pumps supplied by local vendors in Saskatoon.” Given the only point of refuge along the route is the town of La Ronge, about halfway between Saskatoon and Points North Landing, Chorney says truckers carry several spare tires to prepare for the inevitable

flat tire along the way. Over the course of two years, it’s estimated some 300 truckloads will have travelled the 830-kilometre journey making deliveries.

Despite the geographic challenges, Aecon’s work has continued uninterrupted. A new powerhouse for the plant’s electrical supply and distribution is well under way. Located south of the main processing plant, the powerhouse supplies back-up power required to operate the expanded mill in the event of power loss from the grid. The building houses diesel generator modules, a switchgear module, a load bank module and an associated cable bus. A transformer with containment has also been installed west of the new powerhouse, while a new diesel tank was installed to increase fuel storage capacity.

A brand new solvent extraction plant (SX-2) is also being built and will run alongside the existing solvent extraction plant (SX-1). The two



300

TRUCKLOADS OF MATERIALS AND SUPPLIES DELIVERED
TO THE AREVA MCCLEAN SITE IN TWO YEARS

1,660

KILOMETRES TO AND FROM THE SITE PER DELIVERY

8,400

HOURS OF ESTIMATED TOTAL DRIVING TIME

PHOTO COURTESY OF AREVA RESOURCES CANADA

buildings will butt up against one another and be connected by overhead doors and man-doors. The SX-2 building's footprint measures 60 metres by 30 metres and will include multiple storage and process tanks, piping systems, a motor control centre (MCC), overhead crane, HVAC equipment, fire protection and alarm systems.

Completion of the yellowcake drums and reagents storage warehouse's interior, which will store all of the uranium concentrate product culled from the milling process, includes interior concrete slabs and a dock-leveller installation, utility and process piping, HVAC, fire suppression and protection systems, and accompanying electrical and instrumentation installations.

Construction in the remaining areas of the McClean Lake Mill, which represents the bulk of the project work, will begin in 2014 and require two years to complete. Scope of work will involve new

equipment installations in the leaching, yellowcake precipitation, yellowcake drying and packaging, and reagents facilities; upgrades to the counter current decantation (CCD) building, acid plant facility, and on the pregnant aqueous clarification unit; a new stand-alone ammonia system in the SX-1 plant; a new 30-metre-high tailings neutralization plant; and a reconfiguration and expansion of the ammonia sulphate crystallization plant.

CONQUERING THE ELEMENTS

As with all outdoor projects, weather conditions play a pivotal role on the AREVA project. With temperatures dropping below -40 degrees, making sure Aecon's equipment continues to operate and all construction personnel are kept safe is of the utmost importance.

"The extreme drops in temperature can stop production in its tracks if they're not accounted for," notes Chorney. "In preparation for the bone-chilling cold,

we put together a winterization plan to help keep the project on schedule."

The concrete batch plant, located south of the main mill, will be winterized to allow for the continued pouring of concrete slabs and foundations. A key aspect to ensuring the concrete batch plant continues to operate is the heating and hoarding of aggregates. Aecon blows heated air through perforated culverts, which measure 40.6 to 61 centimetres in diameter, into the aggregate to keep it from freezing. The aggregate is also tarped or placed in an enclosure to retain heat.

A DIFFERENT KIND OF COMMUTE

With Saskatoon, the nearest major city, located 830 kilometres to the south, McClean Lake Mill is a prime example of a remote working environment. Every week, AREVA supplies a contractor-only flight for up to 44 people per trip aboard a passenger plane. The contractor flight is in addition to other AREVA flights that ferry employees to site for their seven-

A man is sitting on a stationary bike in a gym, watching a television. The TV screen shows a game. In the background, two other people are playing squash on a court.

// MEETING DEMAND

PHOTO COURTESY OF AREVA RESOURCES CANADA

EMPLOYEES CAN ENJOY THEIR DOWNTIME IN A VARIETY OF WAYS: WATCHING TV IN ONE OF THE THEATRE ROOMS, PLAYING A FEW GAMES OF POOL, EXERCISING IN A FULLY-EQUIPPED GYM, PLAYING SQUASH OR RACKETBALL; HAVING A GAME OF FLOOR HOCKEY IN THE INDOOR GYM, VISITING THE SAUNA, JAMMING IN THE MUSIC ROOM OR TAKING IN SOME OF THE BEST FISHING IMAGINABLE ON PAT LAKE.


A person is standing on a wooden dock at sunset. The sky is filled with colorful clouds, and the sun is low on the horizon, reflecting in the water. A small boat is docked nearby.

PHOTO COURTESY OF AREVA RESOURCES CANADA



PHOTO COURTESY OF AREVA RESOURCES CANADA

day-on/seven-day-off shifts, including people from several remote northern communities. The flight leaves from Saskatoon and makes quick stops in Prince Albert and La Ronge to pick up personnel. After three hours, the plane lands in a camp called Points North Landing. The camp comes complete with its own hotel, restaurant and gift shop and is used as a staging area for a variety of activities in northern Saskatchewan, including a jumping-off point for those making their way to the mill. From there, personnel enjoy a scenic 35-kilometre ride east on Highway 905 across the Canadian wilderness, arriving 40 minutes later at the McClean Lake camp.

While on the job, employees live at the AREVA site camp, which is situated beside Pat Lake, just south of the McClean Lake Mill. All of the on-site amenities have been accounted for, such as cell phone coverage, entertainment

and food. The cafeteria, which provides a selection of balanced meals three times per day, is open 24/7, so healthy snacks are always available.

After working a long 11-hour day, employees can enjoy their downtime in a variety of ways: watching TV in one of the theatre rooms, playing a few games of pool, exercising in a fully equipped gym, playing squash or racketball, having a game of floor hockey in the indoor gym, visiting the sauna, jamming in the music room or taking in some of the best fishing imaginable on Pat Lake.

Fully operational on-site medical facilities are covered by a nurse 24 hours a day, with a first-aid centre situated within the camp.

With about 50 per cent of the current workforce representing local and First Nations people, Chorney says the Aecon team has benefited immensely from working and living at a camp with such strong ties to northern Saskatchewan.

“We’ve learned so much from the First Nations’ deep knowledge of the local weather patterns and the environment,” which, he adds, not only brings valuable insight for the mill expansion work but also, “some pretty entertaining hunting, trapping and fishing stories at the end of the day.”

At the end of each seven-day turnaround cycle, employees hop on the bus back to the landing strip at Points North and are flown to stops in La Ronge, Prince Albert and Saskatoon. From there they head home, and the cycle begins again as the next shift is brought in.

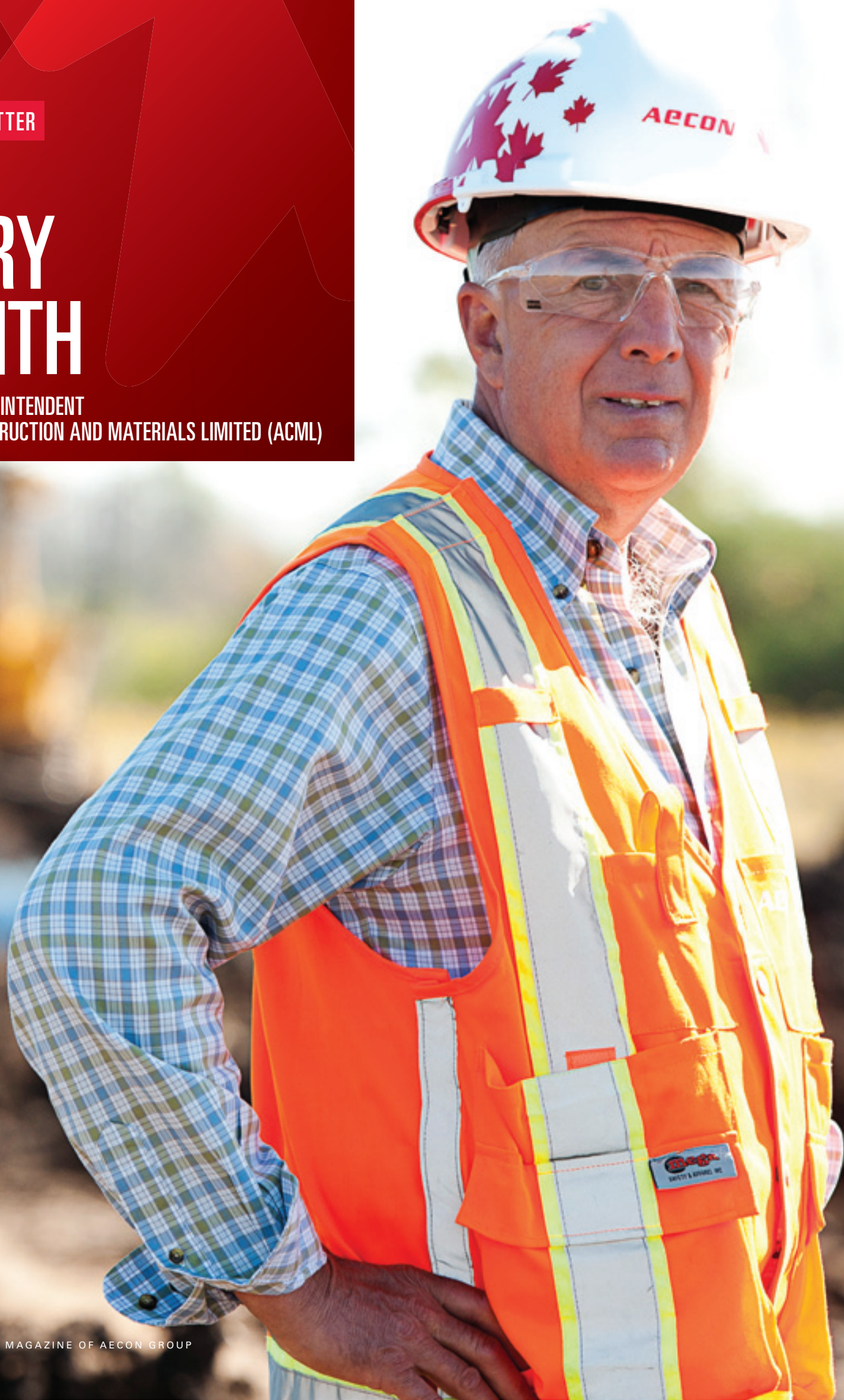
Chorney says progress to date on the McClean Lake Mill expansion project is on track for scheduled completion in January 2016.

MEET:

PEOPLE MATTER

GARY KMITH

SENIOR SUPERINTENDENT
AECON CONSTRUCTION AND MATERIALS LIMITED (ACML)





Over the past 42 years with Aecon, Gary Kmith has moved millions of tonnes of earth and rock, building a solid foundation for the roads and highways in Ontario. Today, as one of Aecon's Senior Superintendents, he's focused on building a different kind of foundation to support the company, and it involves promoting "good people" – and then helping them find success on the job.

You and your brother, Bryon, have both worked for Aecon since high school but, the similarities don't end there. Both of you have had similar careers, as well.

Very similar. We both started as Flagmen with Falgar Construction, which was a division of Peel Construction out of North Bay, Ontario. Both of us worked our way up the ranks to Senior Superintendent. And we both worked in earth moving and grading the entire time. Bryon started a year before me, though, so he has the edge in seniority.

Did Bryon get you your first job?

He was working for Falgar on a paving project on Highway 63 near North Bay and he asked the Superintendent if there were any openings for me. The Superintendent said, "Bring him along!" We grew up in Whitney, a small town on the edge of Algonquin Park, miles away from any major centre. I'd just finished high school, and the opportunities were limited. When Bryon told me I could have a job working on construction, I flung away the books and headed straight up.

For a young kid just out of high school and away from home, that must have been a big adjustment.

It was definitely quite an adventure. I was a Flagman –

the person who directs traffic while everyone else is working – so I started at the bottom. The hours were long. I was living in a camp. But it was a job, and I was making money: \$2.85 an hour, as I remember.

What was it like living in a camp?

It was pretty rough compared to camps today. There was a canteen, washrooms and bunkhouses, each one with about 20 guys in it. I was the youngest, newest and smallest, so I always had the top bunk. To add insult to injury, you had to pay \$25 a month for the privilege! I stayed in the camp for three weeks to a month at a time, working six days a week, from dawn to dusk. Sunday was our day of rest and time to do the laundry, but I used to also help service equipment to get a few more hours in. Being away from home goes with the job. I'm still travelling. I have always lived out of a suitcase.

How long were you there?

Just one season, and then I moved over to a project in Parry Sound [Ontario] working as a Labourer with a raise of 20 cents an hour. The next step was becoming a Graderman, the person who sets the grade for the earthwork and the road base and checks the rock cuts. It was a great learning

experience because you really get to see how roads are built. It also took me up to \$3.15 an hour, which, for a young kid, was big money. I had the world by the tail!

Enough money to get married?

Getting there. Phyllis and I were married in 1977, and there was an Aecon connection there, too. Back then, a lot of people from Whitney [Ontario] worked for Peel Construction. We'd get together on the weekends and drink beer and talk about work. Phyllis' uncles, Doug and Clinton Holmberg, were Foreman with Peel Construction and that's how we met.

When did you become a Foreman yourself?

It was around 1975. I was working on a project on Highway 138, near the village of Monkland [Ontario]. Jack Parris put me in charge of the granular, which was a top-notch job.

You were still quite young, just 24 years old. Did that cause any problems?

Not for me. I always had a lot of respect for the old guys and didn't get much push back.

And that was to be your job for the next 20 years ...

As I said, I've always lived out of a suitcase. I worked on road construction projects all

across Ontario, from the Quebec border to Windsor and as far north as Thunder Bay. One of the biggest projects was the construction of Highway 404, from Davis Drive [Newmarket, Ontario] to Highway 7. We moved about half a million cubic metres of earth. Much of the time, I was working under Everett McIntyre, who was one of our Superintendents. Bryon and I also worked on a number of projects together. I was glad to be working; I had a house to pay for. I wanted to do more, but you had to wait in line. We had a strong bunch of people working for us with a lot more seniority than I had.

Road construction is seasonal work. What did you do in the winter?

Being laid off for three or four months is part of the job. I went home to Whitney, did some snowmobiling and ice fishing, and we'd go down to Florida if we could.

When did you become a Superintendent?

In 1994. We'd been awarded the contract to build Highway 407 [in the Greater Toronto Area], the largest project we had ever done. Not long after I started work on the project at Weston Road, we were awarded another project on Highway 401, near Highway 6. Since everyone was tied up on the Highway 407 project, Jack Parris promoted me to Superintendent for the 401 project. We only had two Superintendents who weren't working on Highway 407: me on Highway 401 and my brother, Bryon, on Highway 101, near Timmins [Ontario].

Did you have any trouble making the transition to Superintendent?

I was a pretty strong Foreman. I did a lot of the jobs on my

own. As a Superintendent, I became responsible for the costs on the project and became generally more accountable. If you weren't making money, you needed a good reason. But I didn't find it too much of a stretch. I grew into it.

You were a grading Superintendent for the next 20 years. What were some of the projects that you worked on?

I did all the big jobs. We worked on Highway 401 and on a big job on Highway 11, near Iroquois Falls [Ontario] ... you name it, we did it. There were two jobs that were particularly memorable, probably because they weren't strictly road construction. The first was a tunnel we built to Terminal 3 at the Toronto [Pearson] International Airport. The first week I was there, all I could do was watch the airplanes. We built the tunnel by open-cut. Basically, you dig a trench and then cover over the top. You'd be working at the bottom of the trench, and an airplane's wing would pass right over the excavation. It was a really cool experience. We also built a taxiway and the north-south runway, so I was at the airport for three or four years.

The other job that stands out was the Latchford Bridge on Highway 11 over the Montreal River, in northern Ontario. The bolts on the old bridge had frozen off, and we had three months to install a temporary modular bridge. We built two bridge abutments on either side of the river and three piers in the river and then pushed the bridge across, adding sections as we went. It was the three coldest months I've ever experienced. The temperature went down to -40°C. We never turned the equipment off. We kept it

running day and night. I hired two night watchmen to keep putting fuel in. We also kept a fire going the whole time. The workers would be out on the job for about 10 minutes and then they'd come back to the fire to melt the icicles off their clothing!

When did you become a Senior Superintendent and how did that change your role within the company?

It was about 10 years ago, and, for the first time, I didn't have my own project. I'm responsible for all the grading work and so I have to rely on a good team for the day-to-day management. I had a lot of support throughout my career, from people like Everett McIntyre, Dave Mackey and Phil Gignac. They helped me to grow, so I like to do the same for the people who work for me. I really love promoting people within the company. I like to recognize good people and give them a chance. The most important thing I do when I make someone a Superintendent is to make sure they don't fail on their first job. If you show them what it means to be a winner, they never look back. I have a lot of pride in the people I've chosen. All of our grading Superintendents came up through the ranks ... and they have my full confidence.

How do you recognize good people?

You want someone who is confident and assertive, who's not afraid to take charge and who gives you a good day's work. If you don't have those qualities, the men will walk all over you.

What are some of the projects you're working on right now?

We're working on a number of jobs around the province:

on Highway 17 at Thunder Bay, moving about a million cubic metres of rock and 800,000 cubic metres of earth; on Highway 407 east of Toronto at the Brock Road interchange; and on Highway 427, near Aecon's head office. We also have a couple of jobs in eastern Ontario on Highway 7, at Marmora and near Sharbot Lake, and a small runway job at the Peterborough Airport.

We've also just started a new project that will really get people's attention: the Canadian Motor Speedway in Fort Erie [Ontario], the largest racetrack in Canada. It's a \$400-million, 65,000-seat facility with a 1.6-kilometre banked oval track and a 4.2-kilometre road course. We're doing Phase I this year – Travis Kmith, my nephew, is the Superintendent – and we'll start Phase II next spring.

Didn't you also work on the rapid bridge replacement project on Highway 417 recently?

We did. That was Aecon's first rapid bridge replacement project and only the fifth one completed in Ontario. The entire bridge was taken out and replaced in 15 hours, which is pretty spectacular, but what you don't see are all the months of planning, preparation and work that goes on behind the scenes. Our earth-moving crews did a lot of the prep work. We were there for several weeks digging out the bridge abutments so that the concrete could be saw-cut. The night of the actual replacement, we had all our Foremen and Superintendents there with excavators at each corner of the bridge. We did the final excavation work and then, once the new bridge was in place, we did the backfilling and compaction so that the approach ramps were ready for paving.



EMPLOYEE FILE

GARY KMITH

POSITION: Senior Superintendent –
Aecon Construction and Materials Limited (ACML)

DIVISION: Aecon Infrastructure

EXPERIENCE:

1972–75 Falgar Construction
Flagman, Labourer, Graderman

1975–94 Armbro
Foreman

1994–2003 Armbro/Aecon
Assistant Superintendent,
Superintendent

2003–present Aecon
Senior Superintendent

EDUCATION:

North Hastings High School, Bancroft, Ontario

BORN: Whitney, Ontario

HOME: Whitney, Ontario

FAMILY: Married to Phyllis; one daughter

AECON FAMILY CONNECTIONS:

Bryon Kmith (brother) – Senior Superintendent

Travis Kmith (nephew) – Superintendent

HOBBIES AND INTERESTS: Fishing and hunting

BEING AWAY FROM
HOME GOES WITH
THE JOB. I'M STILL
TRAVELLING. I HAVE
ALWAYS LIVED OUT
OF A SUITCASE.

— GARY KMITH
SENIOR SUPERINTENDENT,
ACML

**After almost 42 years
on the job, what are some
of the biggest changes
you've seen?**

Apart from starting work at less than \$3.00 an hour?! Certainly, the equipment has changed. As a Graderman, I had to walk back and forth in front of the grader. It didn't take long to wear out a pair of boots. Now, with GPS and laser grade controls, everything is computerized. It's quicker, more efficient and far more

accurate. But I think the biggest change is in people's attitude. When I started, we needed the job and we'd work for two or three weeks without a break. Now, it's hard to get people to come in on a Saturday. They want to go home to the family, and that's probably not a bad thing. It's definitely our job to make sure they can go home to their family. Safety is much more important today – and that's not a bad thing either.

**After 42 years, is it time
for you to go home to the
family, too?**

It's getting there. My wife, Phyllis, worked for the Ministry of Natural Resources and she's retired now. On the other hand, Bryon's still working and he's got one year more than I have, so I'm going to see how things work out.

PROJECT MATTERS

POWERING THE GREAT WHITE NORTH

ATIKOKAN THERMAL GENERATING STATION BIOMASS CONVERSION

The Atikokan Thermal Generating Station in northwestern Ontario has been powering homes and businesses for almost 30 years. With the era of coal plants coming to an end in the province, Atikokan is getting a new lease on life. Ontario Power Generation, with the help of Aecon Energy, is converting the plant's fuel supply from coal to wood – OPG's first biomass-fuelled power plant and the largest 100 per cent biomass-fuelled power plant in North America.



Ten years ago, coal-fired electrical power plants generated a quarter of Ontario's power. In 2003, shortly after the Liberal party was elected, the provincial government started shutting down all the coal-fired plants in the province. By the end of 2014, the last of the plants will cease using coal as fuel. The Atikokan Thermal Generating Station, about 200 kilometres northwest of Thunder Bay, is getting a new lease on life. Ontario Power Generation (OPG) is converting the plant to burn wood pellets.

THE STATION WILL BE THE FIRST FACILITY OWNED BY OPG TO SUPPORT BIOMASS AND WILL BE THE LARGEST 100 PER CENT BIOMASS-FUELLED POWER PLANT IN NORTH AMERICA.

—IAN TURNBULL,
PRESIDENT, AECON INDUSTRIAL,
CENTRAL DIVISION

"The station will be the first facility owned by OPG to support biomass and will be the largest 100 per cent biomass-fuelled power plant in North America," says Ian Turnbull, President, Aecon Industrial, Central Division. "This project has created approximately 300 construction jobs in northwestern Ontario – as well as an additional 150 jobs, or more, supplying wood pellets to the station." It is a move, he says, that will stimulate the regional economy and support an emerging industry.

Wood pellets have long been touted as a more environmentally beneficial alternative to coal. Even though the energy of the pellets is about the same as lignite coal, the pellets produce about 90 per cent less carbon emissions and, unlike coal, come from a renewable resource with what is in effect a carbon-neutral footprint. By replanting the trees that were used to make the wood pellets, the same amount of carbon will actually be soaked up as was generated during combustion. Waste from the combustion process will also be considerably reduced. The ash left over from burning the coal measures about 10 per cent of the original volume. The wood ash measures less than three per cent by volume and can be recycled either to agricultural soil or sent back for forest reincorporation.





PROJECT FILE

Atikokan Thermal Generating Station
Biomass Conversion

CLIENT:
Ontario Power Generation Inc. (OPG)

LOCATION: Atikokan, Ontario

AECON DIVISIONS: Aecon Energy

TIMING: November 2011 – August 2014

OPG PROJECT VALUE:
\$170 million (entire OPG conversion project)

SCOPE:
// Material handling and storage
// Fuel and combustion upgrades
// Transformer replacement
// Ash pond refurbishment

AECON EMPLOYEES:
260, including subcontractors (at peak)

KEY EMPLOYEES:
Material Handling and Storage System
Jason Smith, Senior Project Manager
Dan Joudrey, General Superintendent

Fuel and Combustion Upgrades
Chris Holland, Project Manager
Murray Rehel, General Superintendent

THIS WAS MORE THAN JUST A MAJOR PROJECT IN OUR BOOKS. IT WAS ALSO AN ENGINEERING, PROCUREMENT AND CONSTRUCTION (EPC) PROJECT, AND WE HAVE BEEN A PROPONENT OF THIS TYPE OF CONTRACT MODEL FOR A LONG TIME.

—JASON SMITH, SENIOR PROJECT MANAGER



Switching from coal to wood is, however, a bit more complicated than just switching fuel suppliers. Unlike coal, which is stored in large stockpiles outside the plant, wood pellets have to be protected from the elements (try starting a fire with wet wood) and, although both fuels have similar combustion characteristics, the burners and boiler need to be modified to handle the new fuel. OPG anticipates it will cost about \$170 million to convert the Atikokan generating station from coal to wood.

In November 2011, OPG awarded Aecon a contract to build a new material handling and storage system for the wood pellets followed by a second contract in February 2013 to modify the fuel and combustion systems inside the plant.

BRINGING THE HEAT: MATERIAL HANDLING AND STORAGE SYSTEM

Aecon started work on the Atikokan conversion project in November 2010 when OPG issued its first call for expressions of interest in the project. It was, says Jason Smith, Aecon's Senior Project Manager, a project of considerable interest for Aecon.

"This was more than just a major project in our books," says Smith. "It was also an Engineering, Procurement and Construction (EPC) project, and we have been a proponent of this type of contract model for a long time."

In traditional construction contracts, engineering firms design projects; contractors build them. With a construction-led EPC contract, the two entities form a much more powerful union. Working together to go from concept to final design, engineering firms and contractors can blend modern engineering design with practical experience and the latest construction methods to meet performance guarantees.

"OPG outlined the basic parameters of the project. It was up to us to find the best way to give them what they wanted," Smith notes. "Since we're responsible for the project from start to finish, we can not only come up with innovative ways to meet OPG's requirements but also ensure, based on our experience, that constructability



is built into the plans, which means we can avoid problems down the road.”

Over the next five months, Aecon Industrial Central and its engineering partner, Ausenco, refined the plans for the new material handling system at the Atikokan plant. It was a project that went beyond the typical industrial design process, leading the design team into an exploration of the science of wood particle handling. Aecon used Jenike & Johansson, a Toronto-based materials testing and consulting company specializing in bulk solid storage and handling, to define the flow characteristics of the wood pellets and particles to optimize the design of the conveyors, chutes and silos. Researchers at Dalhousie University helped define the explosive parameters of the wood particles.

The final result, says Smith, was a more compact design with a smaller footprint and lower capital costs than initially anticipated.

In November 2011, OPG awarded Aecon the EPC contract to design and build the material handling system. For the next five months, Aecon and Ausenco worked out the details of the design and procurement, with construction starting in May 2012. Aecon has a permanent staff of about 15 people at Atikokan supervising the project, with the majority of the trades coming from Thunder Bay union halls.

The material handling plans called for two massive concrete silos, each one about 13 storeys high and 20 metres in diameter, capable of storing up to 140 truckloads of wood pellets (about 10 days’ supply of fuel). Conveyors will take the pellets from the silos to the transfer tower and then into the powerhouse.

Once Aecon completed the work on the foundations in March 2013, it was the turn of its subcontractor, FWS Western (Canada’s foremost slipform concrete contractor), to build the silos.

“Slipforming is a well-established technique for building silos,” explains Smith. “You pour a quick-setting concrete into the forms and while you’re pouring the concrete you are also slowly raising the forms. It’s an uninterrupted process – once you start pouring you don’t stop – so what you end up with is a smooth continuous structure without any joints.”

Over the next 10 days, working around the clock, FWS poured the 2,900 cubic metres of concrete to create the two silos, each one rising slowly but inexorably at the almost imperceptible speed of 2.5 centimetres every nine minutes.

Work on the structural steel transfer station, which is about 65 metres tall, started in December 2012 (not ideal when you’re working outdoors in northern Ontario, notes Dan Joudrey, the General Superintendent) and was completed in the spring of this year.



Conveyor bridges connect the mechanical rooms at the top of each silo and the transfer station to the power station. Each bridge was built as prefabricated modules with the wiring, lighting, ductwork, piping and cable trays installed before the bridge was lifted into place 50 metres above the ground by a 600-tonne crane.

With most of the structural work now complete, Aecon's attention is now focused on cladding the transfer tower and completing the mechanical and electrical components of the material handling system. Smith expects start-up and verification will be completed by August 2014.

FUELLING THE FIRE: FUEL AND COMBUSTION UPGRADES

While Aecon was working on the material handling system for the plant conversion, OPG was moving ahead with plans to upgrade its steam boiler and auxiliary systems.

The fuel pellets will be transferred from the silos to surge bins in the powerhouse. Pulverizer mills, which previously reduced chunks of coal down to a fine powder, will break the pellets down into small fibres. The wood is then blown through pipes that feed directly to the burners, which heat the boiler and generate the steam that powers the turbines producing the electricity.

While the basic electrical generation system will remain in place, the burners, pulverizing mills and conveyors need to be adapted to accept the new fuel.

In February 2013, OPG awarded Aecon a traditional construction contract to complete the retrofitting work in the plant.

"One of the challenges of working in an existing facility is the difference in equipment access," says Chris Holland, Aecon Project Manager for this phase of the project. "It's not the same as it would have been when the plant was originally constructed. The space is

very tight and getting access is challenging.

"Take the burners, for example. Even though this is a small generating plant with only one boiler, the boiler is a massive piece of equipment. There are 15 burners, each one weighing in the order of three and a half tonnes, and we had to finesse each one of them into place. It took over a day using tuggers and chainfalls and dollies to get each burner into place at the boiler face – not an easy job by any means."

With most of the fuel and combustion upgrades already completed, Holland expects the retrofitting of the plant will finish by this winter.



MANAGING A TOTAL SOLUTION



AECON FACILITIES MANAGEMENT GROUP

What began as a natural progression for Aecon in a long-standing partnership with Union Gas has since transitioned into a full-fledged business. Today, the new Aecon Facilities Management Group is hard at work, minimizing for clients the challenges often associated with operating a new or existing facility.

IT'S ANOTHER TOOL IN OUR TOOLBOX. WE PROVIDE SERVICES FROM THE EXCAVATION OF A SITE RIGHT UP TO THE MAINTENANCE AND OPERATION OF A FACILITY, WHICH GIVES US A DISTINCT ADVANTAGE IN THE INDUSTRY.

—JEFF PIGOTT
SENIOR VICE PRESIDENT
SOCIAL INFRASTRUCTURE

A new building has much in common with a new life: It relies on the strength, knowledge and expertise of the partnership that both created it and is charged with its care for years to come. Who better to understand the behind-the-scenes intricacies of buildings and ensure their seamless daily management than a company that partners with clients to construct them from the (under) ground up? Such is the foundation of Aecon's recent entry into the facilities management (FM) business. Years of extensive Aecon experience in base building, interior fit-up and ongoing programs work form the backbone of a value-added FM model that offers clients substantial savings over more traditional third-party arrangements.

"It's another tool in our toolbox," says Jeff Pigott, Senior Vice President, Social Infrastructure, when asked to summarize the new Aecon Facilities Management

Group, which operates under the company's Buildings group. "We provide services from the excavation of a site right up to the maintenance and operation of a facility, which gives us a distinct advantage in the industry." What's more, notes Pigott, Aecon can confidently offer these services with the knowledge that in-house resources and expertise – both within arm's reach – create a level of excellence that is unprecedented in facilities management. "Not only do we save money for our clients, we also create peace of mind, which allows clients to focus solely on their business while we either take care of or transition them into their facility with little interruption."

A good chunk of those cost and time savings for clients comes from avoiding the inevitable growing pains associated with introducing a third-party company to maintain their facility. Third parties often

need to be brought up to speed with back-end building plans, equipment and operational requirements, which collectively can slow down the actual facility management process and escalate costs.

From the Aecon business perspective, expansion into the facility management arena is a compelling one. The attractiveness of the long-term contracts typically associated with public-private partnership FM work provides a steady revenue stream.

Wayne Collins, a 23-year FM industry veteran, and Charlie Morana, with 16 years' industry experience, have both joined the Aecon FM Group as Senior Facility Account Managers. Their collective mandate is to grow the business by leveraging Aecon's value-added proposition with existing and potential new clients.

Currently, their major client is Union Gas, with whom Aecon has held a long-standing construction Master



BUSINESS PROFILE

Aecon Facilities Management Group

LOCATION: Toronto, Ontario

RANGE OF SERVICES:

- // Waste management
- // Landscaping
- // Snow removal
- // Pest control
- // Janitorial
- // Paper shredding
- // HVAC
- // Major and minor repairs
- // Asset management
- // Business continuity plans

MAJOR CLIENT: Union Gas

CONTRACT:

Five-year Facilities Management Master Service Agreement (MSA) at \$5 million/year

START: October 2012

COVERAGE: Ontario

68 Corporate real estate sites

78 Storage transmissions operations

15,000 Station meter sites

KEY EMPLOYEES:

Jeff Pigott, SVP, Social Infrastructure

Jim Field, VP, Buildings Ontario

Justin French, Programs Director

Wayne Collins, Senior Facility Account Manager

Charlie Morana, Senior Facility Account Manager



AFTER THE FIRST THREE AND A HALF MONTHS OF PERFORMING FM SERVICES FOR UNION GAS, THE FEEDBACK WE RECEIVED WAS EXTREMELY POSITIVE. THEY FELT ENTIRELY CONFIDENT THAT WE WERE MEETING THEIR NEEDS. TO BE ABLE TO ALIGN YOURSELF LIKE THAT WITH AN FM CLIENT SO EARLY IN THE TRANSITIONAL PHASE IS UNIQUE IN THIS INDUSTRY. IT USUALLY TAKES ABOUT TWO YEARS FOR A RELATIONSHIP TO REACH THAT POINT.

—CHARLIE MORANA, SENIOR FACILITY ACCOUNT MANAGER



Service Agreement (MSA). A business unit of Spectra Energy, Union Gas is an Ontario-based natural gas storage, transmission and distribution company that serves 1.4 million residential, commercial and industrial customers in 400 communities across the province. An established connection between Union Gas and Aecon's Utilities group helped open the door for Aecon's Buildings group to bid on, and subsequently win, an initial construction MSA in 2006. Now in its third successive term, the MSA calls upon Aecon to provide construction management (CM) services for numerous Union Gas facilities across Ontario. Work has included several new builds, interior renovation projects and miscellaneous mechanical/electrical retrofits.

"From our perspective, the move to facility management services for Union Gas was a natural progression, given all the work we've done for them over the years and the trusted relationship we've developed," says Morana. "Even so, we still had to earn that FM work through a formal bid process."

That FM work officially arrived in October 2012, when Union Gas awarded Aecon a second MSA, this one specifically addressing facility management services for all 68 Union Gas facilities across the province. The slate of service offerings included in the agreement ranges from waste management and HVAC work to landscaping and snow removal. To date, the extended partnership has proved to be immensely beneficial for both Aecon and Union Gas.

"After the first three and a half months of performing FM services for Union Gas, the feedback we received was extremely positive. They felt entirely confident that we were meeting their needs," notes Morana. "To be able to align yourself like that with an FM client so early in the transitional phase is unique in this industry. It usually takes about two years for a relationship to reach that point."

Morana's colleague Wayne Collins concurs, taking care to acknowledge the advantage of having proven teams in place across the province. "Our Union Gas account is unique in the sense that we're managing numerous facilities across a large geographic area. To self-perform work that's potentially hundreds of kilometres away means

you really have to know how to manage your people, and that's really what facilities management is all about – maximizing efficiencies across all the facilities. Aecon's proving we have that expertise."

Collins says regional FM Managers and General Maintenance Technicians (GMT) are stationed at central locations across Ontario, standing ready in anticipation of a client's needs. A call centre established by Aecon triages incoming calls and emails as soon as an issue is identified. Customer service representatives sort through an average of 40 calls a day, which translates into an estimated 11,000 requests per year. Even if the issue isn't within Aecon's scope of work, notes Morana, the call centre will redirect the request to an appropriate party for further assistance.

"Our core value at Aecon is safety and, from a facility management perspective, providing a safe and healthy work environment for everyone associated within a facility is Aecon's top priority, whether it's within our scope or not," he explains. "We take care of the logistics so both our client's employees and our own can have the right tools to get the job done."

As the Aecon Facilities Management Group evolves, additional services will be introduced, such as Asset Management Planning, Capital Planning, and Business Continuity Plans (BCP). In so doing, Aecon's FM Group will further distinguish itself from its competition by helping clients better prepare for future building concerns, both expected and unexpected.

"Our goal is to continue to develop new clients, expand our services and refine our service delivery so that we maximize our benefit to clients," says Collins.

"We have a clear vision for the Aecon Facilities Management Group, and it complements our corporate "ONE Aecon" strategy of offering complete, integrated solutions for our clients."

GETTING A HAND UP ON SAFETY

By Mike Archambault
Senior Vice President, Chief Safety Officer



Our hands and fingers enable us to perform precise and complex tasks. They are designed to last us our lifetime and we need to ensure they are protected from any injuries. In 2013, approximately 25 per cent of all injuries sustained by our employees occurred to the hands and fingers. The majority of these injuries were a result of handling sharp, hot or cold materials, or being pinched between two objects.

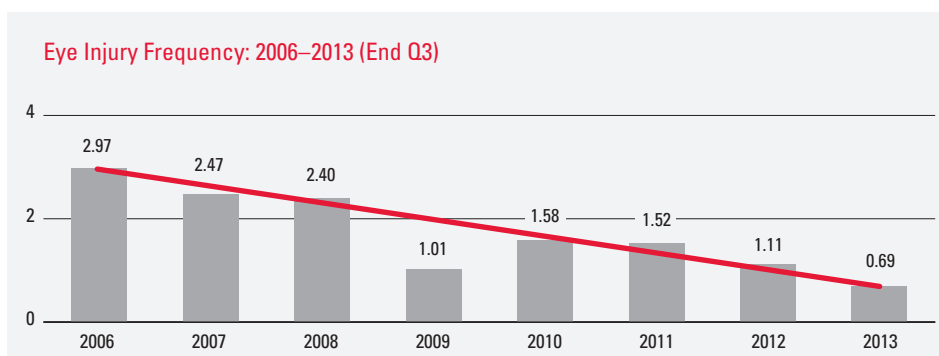
In 2006, we identified a similar trend with injuries to the eyes and knew we needed to take action. The EHS Department developed a multi-pronged eye injury prevention strategy that involved working directly with manufacturers to identify improved safety glass products, the introduction of fit testing and mandatory improved eyewear, as well as a targeted poster awareness campaign and dedicated safety talks focusing on the importance of eye protection.

The results of this concentrated effort? The frequency of eye injuries across our company from 2006 to 2013 (as of the

end of Q3) has dropped from 2.97 per 200,000 hours worked to 0.69 per 200,000 hours worked; that's a 77 per cent drop in eye injuries.

We are confident our new Tether Program will be just as successful at combatting our hand and finger injuries.

The Tether Program will utilize awareness programs to focus on the importance of hand safety, Toolbox Talks to review best practices in hand protection, as well as targeted coaching and behavioural observations. Most notable will be the introduction of mandatory tethers on jobs sites. We'll be sharing more information



NOTE: FREQUENCY IS BASED ON 200,000 MAN HOURS WORKED.

**BY CONTINUING
TO WORK TOGETHER,
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on this new initiative in 2014 as we roll it out across the company.

Our Glove Program is designed to assist employees in making the best decision when choosing the right gloves for the task they are performing. A poster campaign was launched with detailed information on the specific hazard each glove type can help protect against. By combining the new Tether Program with the Glove Program, employees are able to make the best choice in hand protection and have that protection available at all times.

Although safety is everyone's responsibility, we also need to

embrace the philosophy of PEERS KEEPER and ensure we coach one another as soon as we notice someone has placed his or her hands, fingers or other parts of the body in dangerous situations. This open, candid and proactive approach to safety will benefit everyone at Aecom.

The EHS Department will also be placing a strong focus on actively observing and coaching all employees on the safe work practices and behaviours we use each and every day. These proactive activities will enable us to *prevent* injuries before they happen and are considered

key to continuous improvement.

Focusing on these leading activities will ensure everyone has appropriate hand protection readily available and we can begin to work toward a significant reduction in hand and finger injuries, similar to the success we realized with eye injuries over the last several years.

By continuing to work together, we can ensure a Safety First culture that helps us all make it safe and make it home.



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