CIMA+

Engineering for **people**

Kruger Brompton, Trajectory of the outsized carriers

Nomination for:

Canadian Consulting Engineer Awards 2021

CATEGORY F:
SPECIAL PROJECTS

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30 YEARS

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Engineering for **people**

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Departure from the carrier of the port of Becancour

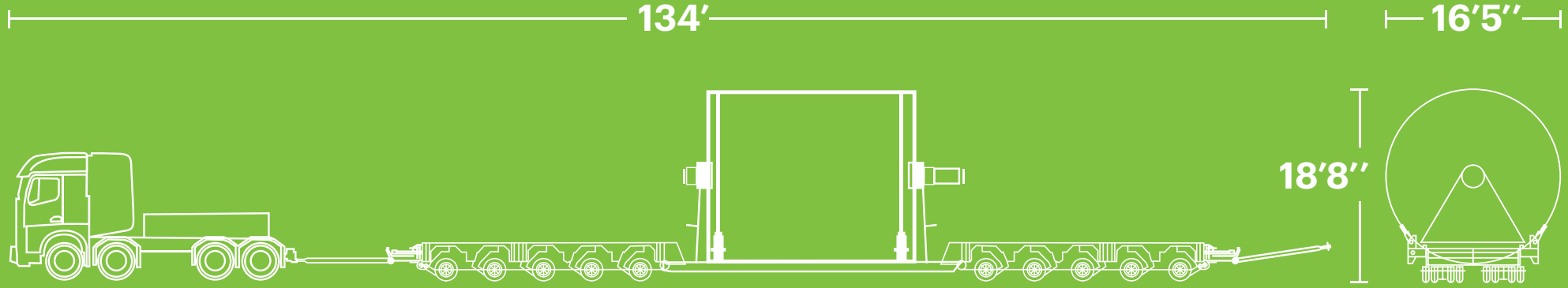
Project summary

During the expansion of the Kruger plant in Sherbrooke, three out-of-standard mechanical parts far exceeding the legal transport loads were to be transported from the port of Becancour to the work sites. Mandated by the carrier M&J TTR, CIMA+ inspected and evaluated the carrying capacity of 25 structures and made modifications at several intersections along the road. The teams worked around the clock to complete this urgent mandate to meet deadlines and deliver quality work.

Innovation

For the expansion of the plant, three oversized mechanical parts arriving by boat at the port of Becancour were to be delivered to the work site before the end of December 2019. The carrier M&J TTR required an out-of-standard transportation permit as the weight of each of the transport loads was more than 200 tons, well in excess of the legal design burden of the 63-ton structures established by the Canadian Code on the Calculation of Road Bridges (CSA-S6). Prior to the issuance of the permit, the Ministry of Transportation of Quebec (MTQ) required the structural evaluation of the bridges and culverts located on the road of the carrier by a consulting engineering firm.

In early October 2019, CIMA+ was mandated to respond to all inspection requests, evaluations and monitoring made by MTQ for SolTec and M&J TTR companies that were working together to deliver the oversized parts within the very short time frames imposed (two months).



200 Metric Tons Carrier

Out of Standard vehicle loading

Validation of the out of standard vehicle configuration (number and spacing of the wheels and axles) and verification of actual axial masses before transporting the load with the help of scales. This was done to ensure that the characteristics of the vehicle matches the claculations of the hypothesis and the permit specifications

Innovation (suite)

Our primary mandate was to inspect and assess the carrying capacity of nearly 175 structures with 25 major structures (11 bridges, 14 large culverts and nearly 150 smaller culverts) located on the carrier's road going from Becancour to Sherbrooke. Also, we had to prepare the traffic maintenance plans during transport and carry out the monitoring during the passage of the out of the norm vehicle while crossing over structures and conduct reinspections after passage. In sum, more than 5,794 pages of the report were submitted to the MTQ for approval.

One of the major bridges to be secured by the CIMA team present on the trajectory (P-11689)

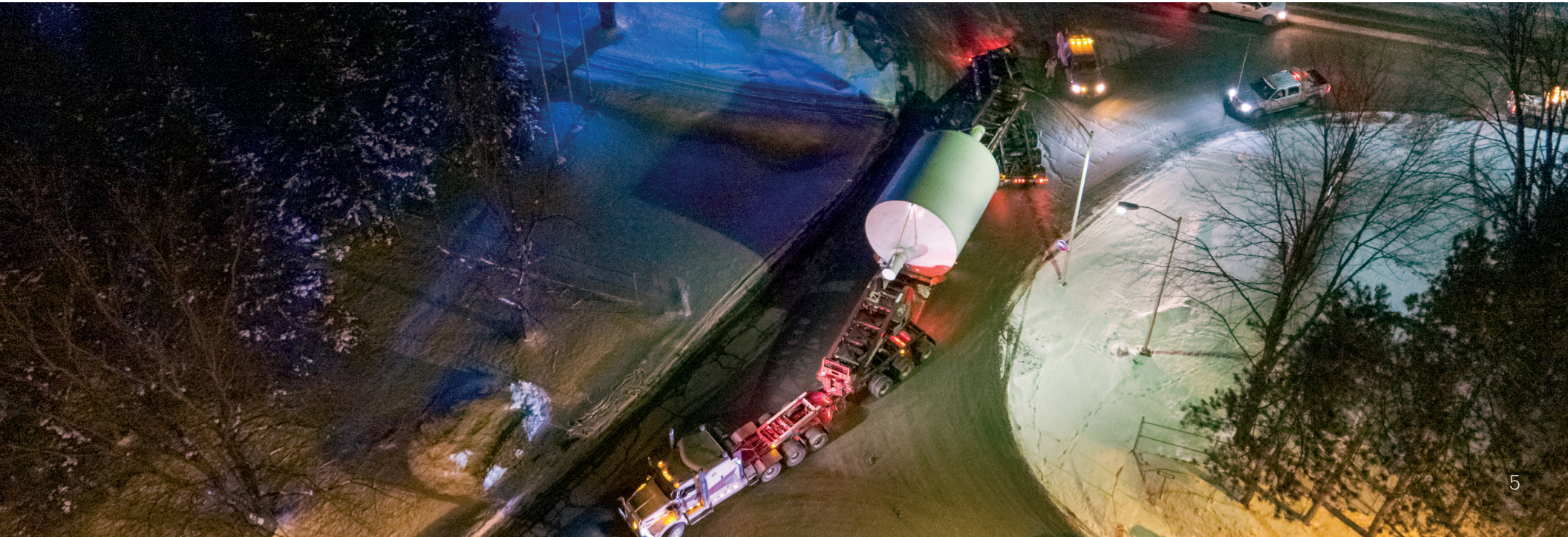
Code Structure	Road	Obstacle	Municipality	Type	Total length	Construction
P-11689	St. Albert	Nicolet River	St. Albert	Steel beams	108.6 m	2004
P-10939	St. Albert	Pine River	Warwick	Prefabricated pre-stressed concrete beams	47.4 m	2003
P-13864	116	Pine River	Warwick	Reinforced concrete crutches bridge	49.5 m	1972
P-15956	Marie-Victorin Blvd.	River of Roses	Kingsey Falls	Reinforced concrete portico	28.8 m	1990
P-15337	Council Boul.	Nicolet River Southwest	Danville	Prefabricated pre-stressed concrete beams	59.1 m	1978
P-06357	216	Stoke River	Stoke	Reinforced concrete beams	29.3 m	1965
P-05266	226	Gentilly River Southwest	Becancour	Steel beams	37.2 m	1954
P-00551	261	Becancour River	Maddington Falls	Steel beams	78.4 m	2011
P-13680	161	Highway 20	St. Eulalie	Prefabricated pre-stressed concrete beams	143.5 m	2008
P-00585	161	Black River	St. Valère	Reinforced concrete beams	21.4 m	1959
P-00584	161	Bullstrode River	St. Valère	Reinforced concrete beams	58 m	1958

Code Structure	Road	Obstacle	Municipality	Type	Opening	Embankment
P-10091	116	Desrochers Water Courses	Warwick	Rectangular	4.6 m	2.2 m
P-12902	116	Stream	Danville	Rectangular	4 m	2 m
P-12946	249	Stream	Asbestos	Rectangular	3.7 m	2 m
P-06360	216	Stoke's Unload, Lac	Stoke	Arquéen steel	4,7 m	1 m
P-11451	4th Rank	Dorman Creek	Stoke	Rectangular	6.1 m	1.2 m
P-12959	4th Rank	Water courses Side	Sherbrooke	Rectangular	3.1 m	1.1 m
P-12906	143	Maheu Creek	Val-Joli	Rectangular	4 m	7.5 m
P-12642	261	Gaudet Creek	Maddington Falls	Arquéen steel	2.3 m	1.3 m
P-12654	2nd Rank	Portage River	Daveluyville	Circularen steel	4.3 m	6.8 m
P-18768	2nd Rank	Mayrand Creek	Daveluyville	Rectangular	4 m	4.3 m
P-10961	11th Rank	White River	Aston Junction	Rectangular	4.6 m	0.6 m
P-19020	11th Rank	Stream	Aston Junction	Rectangular	3 m	1.3 m
P-18839	161	Godin Creek	St. Samuel	Rectangular	3 m	3.5 m
P-12632	161	Beland Creek	St. Samuel	Circularen steel	2.5 m	11 m

Innovation (suite)

Given the size of the mandate and the very short time frame, seven offices (Laval, Longueuil, Montreal, Sherbrooke, Terrebonne, Burlington and Saskatoon) were mobilized and worked day and night to complete the project on time without compromising the quality of the work rendered.

In addition to weekly client and internal meetings, our internal resource management system has been utilized to properly distribute the various tasks among the offices involved. All tasks were clearly identified, and a manager was appointed for each of them. With such a tight schedule, all project participants had to make the necessary efforts to complete the deliverables on the scheduled date.

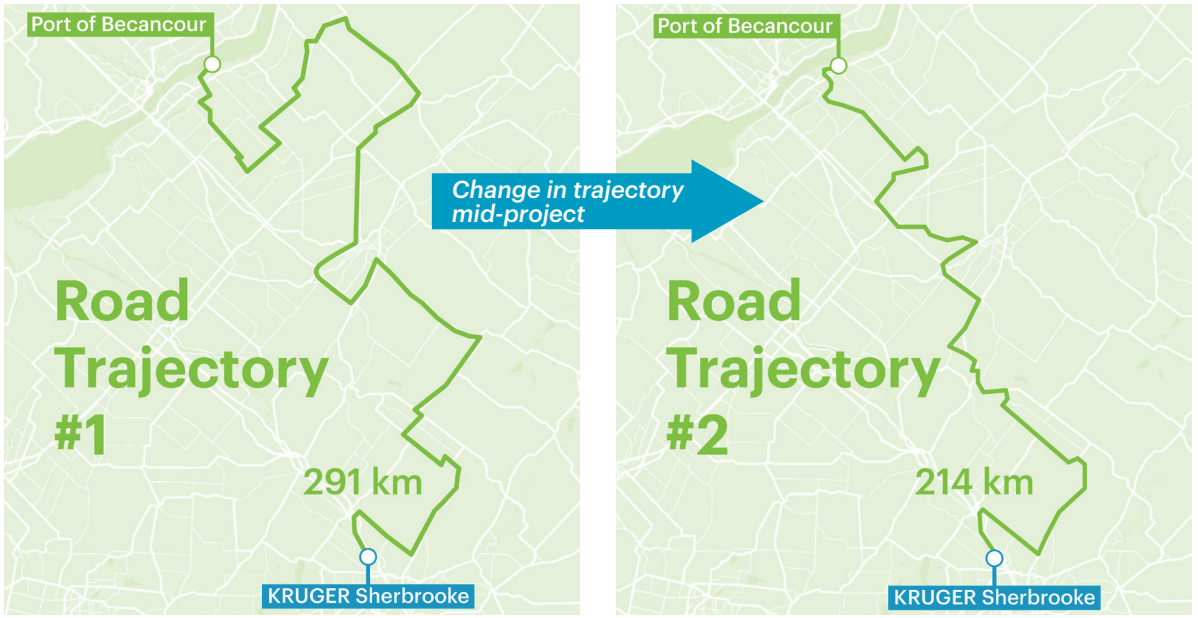


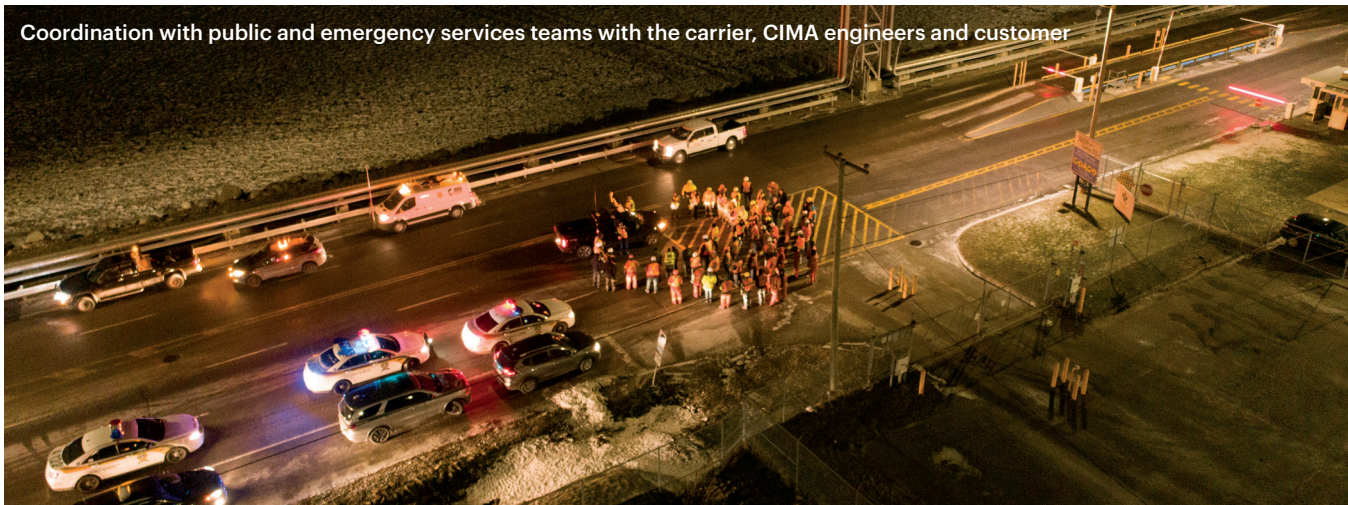
Complexity

Due to the short time frames for completing the mandate, CIMA+'s maneuver margin was very limited. To ensure that the carrier and MTQ meet the deadlines, the various CIMA+ teams had to collaborate closely together.

CIMA+ was granted the mandate in the first week of October 2019. The inspection and evaluation reports were to be completed by the first week of December 2019 and then forwarded to MTQ for approval. The designated road trajectory of the carrier originally planned changed in mid-November bringing a lot of challenges. From the 24 structures already analyzed on the initial road trajectory, only 13 were also present on the new mapped out road, which now consisted of 25 structures. The inspection had to be done urgently and then the evaluation of the 12 missing structures was required to ensure the timely delivery of the reports in early December.

During the monitoring of the load passage, which took place exclusively at night over a period of more than a week, 12 companies worked together, and more than 40 vehicles collaborated for the transport survey, including 5 vehicles of our organization. Our team ensured that the out-of- standard vehicle passed on structures at the right points thus balancing the weight and avoiding creating deficiencies for the involved structures.




Coordination with public and emergency services teams with the carrier, CIMA engineers and customer

Conditions to be respected for the passage of the out of norms vehicle over the structures

Passage over the 11 bridges

1. Total load of 200 metric tons
2. Traffic passage in the center of the bridge
3. Speed less than 10 km/h
4. No sudden braking and/or acceleration on deck
5. No other vehicles on the structure and no additional loads requiring the bridge when passing the out of norms vehicle
6. Presence of a CIMA+ engineer during the passage of the truck

Passage on the 14 culverts

1. Setting up and installing the temporary bridge
2. Installing the temporary bridge centered with the longitudinal axis of the culvert
3. Installing the temporary bridge in the center of the road direction or lanes
4. No other vehicles on the road and no additional loads requiring the temporary bridge when passing the out of norms vehicle
5. Total load of 200 metric tons
6. Speed less than 10 km/h
7. Presence of an engineer during the passage of the truck

CIMA+ engineers monitored the passage of the outsized vehicle over each of the structures

Social and/or Economic Benefits

The digital air we face in recent years is leading to changes and transformation of existing businesses. To meet future needs, companies must adapt and invest to recreate and push innovation further. The Kruger factory in Brompton, which mainly makes paper for journal use, is reinventing itself by adding tissue paper for toilet paper and paper towel fabrication to their line.

More than $575 million is being invested in the creation of a new plant, close to the existing one, creating 180 additional jobs in the region in addition to the 1,700 jobs that will be generated during the construction period. A large number of local suppliers are involved in this huge project, which is due to be completed in 2021.

This project, on an unprecedented scale, will strengthen Kruger's presence in Quebec, continue the company's growth and better serve their customers in North America. The Brompton plant is becoming a major hub for tissue paper production in Quebec and will have significant benefits for the region.

575$ million investment

180 additionnal jobs

1,700 jobs created during the construction

Local suppliers involved

Environmental Benefits

As the environmental footprint is very important to Kruger's management and the government, the new plant will include a fabric paper machine with cross air drying (TAD) that is the world's most advanced technology for the manufacture of «ultra-premium» tissue paper products.

Allowing the least amount of fibers to be used for a larger, high-end product, TAD is more durable and offers both remarkable softness and increased absorption capacity. The Sherbrooke complex will also include processing lines.

Safe arrival of the convoy at the Kruger factory in Sherbrooke

Meeting Client's Needs

Due to the load and sizing of the three parts required to build the plant, the client required the services of an engineering firm capable of carrying out inspection, design and contract administration (monitoring) services for several structures and road infrastructures on the road between the port of Becancour and the Sherbrooke plant within a very short delay of completion and on timely basis. CIMA+ has been able to meet its customer's expectations by supporting them every step of the way and providing a quality service. When the road changed trajectory, CIMA+ immediately acted and was able to mobilize its team quickly.

In addition, CIMA+ provided contract administration (monitoring) of the structures throughout the duration of the overnight transportation, which took place during the period from December 16 to 22, 2019. The team accompanied the carrier, the customer and MTQ throughout the journey. The three parts were docked at their destination on time to the customer's satisfaction. The project, with international visibility through the involvement of several stakeholders, allowed us to meet the challenge with distinction. We met all the needs and provided a remarkable quality through all our services.

The project was awarded by the Specialized Carriers and Regging Association (SC&RA) by winning the Transportation Project of the Year award, allowing us to demonstrate our know-how internationally.

Kruger

Le 12 avril 2021,

Monsieur Alexandre Pépin, ing.
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Bonjour,

En octobre 2019, CIMA+ a été mandaté pour répondre à toutes les demandes d'inspections, d'évaluations et de surveillance formulées par le Ministère dans le cadre du cheminement de trois pièces hors normes arrivés au port de Bécancour jusqu'à l'usine Kruger de Sherbrooke.

Compte tenu du contexte et des délais serrés, CIMA+ a su relever les défis présentés à eux et à livrer dans les délais leur mandat. Ils ont su nous appuyer tout au long de ce processus.

En sommes, nous sommes très fiers de la réussite de ce projet et nous considérons que CIMA+ y a contribué grâce à la qualité des services rendus, à l'implication de leur personnel et à leur expertise déployée vers la recherche de solutions innovatrices.

Cordialement,

Jean-Pierre Perreault

Jean-Pierre Perreault
Directeur de projets

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