

A Publication of Lakehead Constructors Inc.

SPRING 2020



Look to Lakehead



SAFETY • QUALITY • SERVICE • INNOVATION





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Founded in 1916 by Roland Buck, a civil engineer, Lakehead Constructors has played a significant role in providing construction services to building and maintaining the area's key industries that drive our economy and support our communities. Over our 100+ year history we have built some of northern Minnesota and Wisconsin's major industrial facilities, unique commercial projects, critical transportation infrastructure and many historical restorations. Our legacy and sustained success is due to the philosophy of our founding fathers — *"Do good work, be responsible, act with integrity and take care of the community and people who work for you."*

Mission Statement

The mission of Lakehead Constructors is to provide innovative, reliable and high-quality services to clients throughout the Upper Midwest. We treat our clients honestly and provide services that represent an excellent value. We fulfill our mission by developing highly trained and loyal employees who work as a team to anticipate, identify and respond to clients' needs.

Vision Statement

Lakehead Constructors' vision is to be the contractor of choice for our clients. Our exceptional employees allow us to partner with clients to continually identify ways to improve existing services and to build on Lakehead's experience and quality innovation to adapt our expertise.

Markets We Serve

Industrial and Manufacturing
Institutional and Commercial
Mining and Steel Industries
Oil and Gas
Power Generation
Railroad
Water/Wastewater

Services We Provide

Boiler Repair
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Vacuum Truck

Safe Production – ZERO Injury

- Record production with lack of injuries
- Good housekeeping and orderly work areas
- Well-maintained equipment, proper training and procedures
- Looking out for and correcting each other
- Safe conditions, safe behavior

Client Focus

- Listening to the client
- Being responsive and on time
- Meeting quality expectations
- Helping the client succeed
- Take action on feedback

Advocacy for Our Clients and Industry

- Supporting sensible industrial projects
- Workforce Development – careers in construction
- Economic Development in community and region

Bias for Action and Client Value

- Getting things done and done right
- Elimination of waste and inefficiency
- Breakthroughs in productivity and technology
- Plan the work – work the plan

Trust, Respect and Open Communication

- Open access to information
- Delegation to the appropriate level
- Toleration of failure in pursuit of business success
- Encouraging the acceptance of different opinions

Group/Individual Accountability

- Behaving in line with our core values
- Being responsible for our actions
- Providing plans/standards/expectations
- Holding yourself and/or the group to a high standard of performance
- Gender and racial diversity
- Walk the talk

Integrity

- Doing what you say you're going to do
- No hidden agendas
- Doing the right thing
- Being truthful
- Be credible

Teamwork

- Actively involve others in decision-making
- Know when to take a leadership role and when to be an active member
- Recognize the value of teamwork and the synergy it creates

Recognize and Reward Achievement

- Celebrating successes
- Stress training and development
- An effective appraisal of performance
- Giving a simple thank-you

Environmental Stewardship

- Going beyond compliance
- Anticipating and addressing potential impacts before they occur
- Operating to conserve the environment for future generations

These core values are important to our future. Everyone will be judged on his or her support of and commitment to them.



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Grateful for Our Accomplishments

In 2019, we met many goals and were able to celebrate several of these major accomplishments with our employees and you, our valued customers, trade partners and “friends of Lakehead.”



Some of our goals put us on a path toward a sustainable future for the next 100 years at Lakehead Constructors. We aimed to better serve our customers, diversify into new markets, hire talented employees, build two new state-of-the-art construction offices and reenergize our already great culture.

In reflection, we’ve exceeded these goals, and I am pleased with how our progress represents our guiding core values of *safety, quality, service* and *innovation*.

Safety — In August 2019, a ribbon-cutting ceremony was held for the recently completed North Shore Mining DRI Grade Pellet and Power Plant projects where Cleveland Cliffs recognized the safety

success of working over 500,000 hours without a lost-time accident.

Quality — Lakehead Constructors went through a three-year audit in July, and received recertification for our ISO 9001:2015.

Service — Thank you to our many customers who have completed our post-project surveys and let us know that we are meeting our service goals. Your feedback helps us in continually improving the Lakehead experience. As a company, our generous employees are committed to helping us serve our communities. We are so happy to give back to great causes, such as the United Way of Northeastern Minnesota, Salvation Army,

Northern Lights Foundation and Courage Kenny to name a few.

Innovation — We innovate by being committed to our employees through training for safety, communication, new products and services. Furthermore, providing two new state-of-the-art offices inspires the innovations yet to come.

The 2020 edition of this magazine features some of our notable projects and highlights some of our “other” service offerings. Our main feature is the story of building our new Superior office. Other stories include a look into our Scaffolding Group, a feature on Lake Superior Warehouse, a glance at the Warroad

River Series Compensation Station and the rehabilitation of a secondary clarifier for WLSSD.

With our continued efforts to provide the industry with the best services and results, we look forward to working with all of you toward another successful year and, as always, to being the contractor of choice.

Best regards,



Brian Maki
Chairman, President and CEO



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SCAFFOLDING GROUP

by Larry Wallin, Lakehead Constructors Senior Project Manager

"How are we going to safely access that work?" This a question we are frequently asked at Lakehead Constructors. Fortunately for us and for our clients, we have a group that specializes in supporting all of our markets. Lakehead Constructors has performed scaffolding design and erection in support of work access for our forces for as long as we have been engaged in the industry.



As the leadership and technical abilities of this specialty support craft have grown over the last 10 years, the group of individuals associated with this work has evolved into an entity of its own within our company.

As Lakehead's work expands across the Upper Midwest, this critical group of construction support craft individuals continues to grow in order to meet our challenges. Some of these challenging projects are just getting under way in the winter of 2020. They include setting up a 17-story scaffolding build inside the boiler of a power generation facility, erecting scaffolding for a major taconite plant outage and quickly erecting scaffolding on one of the several 1,000-foot cargo vessels wintering in Duluth/Superior for maintenance when the Soo Locks are closed.

The individuals involved are well respected by all trades for their technical skills and for the physical prowess required to do this kind of work.

Working under the umbrella of Lakehead Constructors' general safety and construction planning policies enables this group to work as a support function for internal projects, as well as a separate entity for support of other projects and customers for a wide variety of scaffolding and shoring construction.

Specialty designs and engineering are utilized for complex structures, as well as for sensitive projects with weight distribution or other restrictions.

Customers of these services are wide-ranging and include mining, power, ship maintenance, oil and gas, paper, wood products, wastewater/water treatment and institutional facilities.

Individuals working within this group are typically experienced, trained and certified for the erection, inspection and "tagging" of these structures with respect to their uses and limitations.

Lakehead Constructors utilizes a supply partner for most of this work. Each component used in these structures is uniform in capability and engineered to meet the diverse applications and configurations used.





Superior Services for Lake Superior Warehouse

Lakehead Constructors has had a partnership with Lake Superior Warehouse (LSW), the operating agent for the Duluth Seaway Port Authority, since 1991, when they assumed the operations of the port terminal. LSW is responsible for managing the day-to-day operations of the Duluth Seaway Port Authority's Clure Public Marine Terminal. Under the name Duluth Cargo Connect, the two collaborate and collectively move some of the largest shipments coming through the Great Lakes. Duluth Cargo Connect earned international recognition for handling their cargo and heavy lifts when *Heavy Lift & Project Forwarding International* (HLPFI) named them 2019 Port/Terminal Operator of the Year.

The Clure Public Marine Terminal is a 120-acre site on Duluth's harbor and features seven vessel-docking berths, access to four Class 1 railroads with on-dock rail and twin 81-ton gantry cranes. Working hand in hand with LSW employees for nearly three decades, Lakehead has provided crane operators to run the cranes used to offload and reload cargo. Lakehead also provides ironworkers for miscellaneous hot work

projects, such as cutting loads secured with welds from a load on a ship or securing outgoing loads onto railcars.

In 2019, LSW loaded and unloaded a record-setting amount of over 306,000 tons of wind turbine components at their facilities thanks to the help of Lakehead Constructors. People who visited Duluth last summer and ventured down to the Aerial Lift Bridge may have seen the BigLift *Happy River* ship going to the terminal, loaded with wind



turbine towers and blades. The *Happy River* vessel made nine visits to Duluth, primarily transporting wind turbine steel towers fabricated in eastern Canada. Each trip, the vessel carried 42 wind turbine tower sections, weighing in at 120,000 pounds. During the longer days of summer, LSW and Lakehead crews were able to unload all 42 tower sections in a 12-hour day.

Another impressive feat is the offloading, storage and reloading of the wind turbine blades. It seems like every year they get larger. This past year, LSW and Lakehead Constructors handled 168 blades (or 56 sets of three blades). They were 225 feet long and weighed over 40,000 pounds each.

In addition to the wind cargo, LSW sees other unique cargo loads, such as large vessels for oil and gas production, and large bore pipe and clay for industrial processes.

In 2019, Lakehead Constructors was engaged in the annual inspection and maintenance of the two Port Authority-owned 81-ton gantry cranes. These older cranes, which run on a track on the pier at the terminal, are the workhorses for offloading most of the cargo, so keeping them fully operational is mission critical. Lakehead also installed new cables and blocks on the whip lines of the gantry cranes.

Our experienced and knowledgeable crane operators are the key to Lakehead Constructors providing top notch services to LSW. "I appreciate working with Lakehead and the quality service they provide, having trained operators who know what they are doing, how to operate some



of our older, unique equipment and how to work through the intricacies of our operations," said Pete Kramer, LSW's operations manager. Two of the crane operators who have been steadies on site more than eight years are counted on to run the port's two gantry cranes. According to Jonathan Lamb, president of LSW, "Their ability to work together on gantry tandem picks is impressive, perfect harmony." Lamb added, "Lakehead Constructors has been a valued partner for over 25 years. They know our cargo business, the maritime part of the business, how to work with our employees, [and] they understand and fully support our expectations. When we work with Lakehead, they set the standards for safety very high and everything goes smooth[ly]. They play a key part in Lake Superior Warehouse retaining our customers and attracting new customers."

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Building Our Future, Building Our New Superior Office



As we continue to build on our past successes, great service and long-term relationships, we also look to the future and set high standards and goals for our sustained growth. In 2019, we achieved two major goals: building and moving into our two new offices.

Both milestones were celebrated at open houses in our new Aurora, Minnesota, and Superior, Wisconsin, offices. These celebrations were for our clients, vendors, employees and “friends of Lakehead.” After several months in our new Superior facility, everyone can agree on how nice it is to work in a building that reflects our spirit, capabilities, pride and professionalism.

The new Superior office started as a thought — a vision Brian Maki, chairman, president and CEO of Lakehead, had back in 2016 as Lakehead Constructors celebrated our 100th year in business. As he was reflecting on the facilities in Superior, he realized that it was time to look for a new location in the area where we could build something modern that reflected our true capabilities and had a more efficient layout. Someday, Lakehead Constructors would build this new office.

During the October 10, 2019, open house ceremony, “someday became today,” all thanks to Brian’s vision and a lot of hard work from our project team, trade

partners and suppliers. A great deal of effort went into the front end of working out a deal with the city of Superior to keep Lakehead in the city that we’ve called home for 104 years now.

The new office sits on a 6-acre site at an industrial park in Superior, strategically located just off Highway 2 between the St. Louis River and AMSOIL Inc. This location provides easy interstate access to all major highways (Highway 2, Highway 61, Highway 53 and Interstate 35) for our clients in the Duluth/Superior area, the Iron Range, Grand Rapids and the North Shore.

Cory Schmidt, Lakehead’s purchasing manager, played a key role in working closely with the city of Superior’s Economic Development Office and the Development Association to get the site secured. Cory also worked closely with the architect, Building Rescue, to program the initial design and engage the subcontractors and suppliers. After six months of planning, the project was turned over to the capable hands of our construction team: Brian Johnson, project manager, and Randy Koenen, superintendent.

With the clock ticking, we officially broke ground on a very frigid morning in early April 2019. By this time, we had sold our current office, warehouse and yard facilities to long-time client Husky Energy’s Superior Refining Company. We committed to Husky Energy that we would move out of the old facility and into our new office by September 3, 2019.

We did it. Lakehead Constructors and the project team did what is often talked about in our industry but rarely done. From groundbreaking in early April to completing the new office and moving in on September 3, the process took us a mere 152 days, or five months.

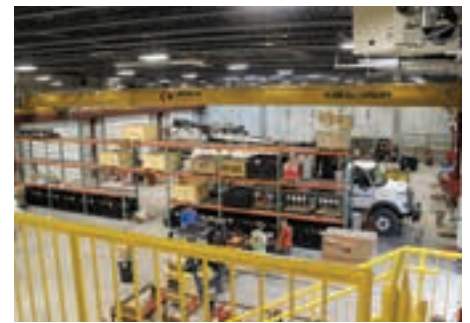
We attribute the quality and speed of delivering this project to using an integrated design-build approach. Hiring the architect directly and working closely with the design consultants allowed an expedited timeline to get the project designed, permitted and bid for construction. Once in construction, Lakehead acted as a traditional general contractor and self-performed concrete,



steel erection, carpentry, crane and general laborer support.

The new \$6.5 million facility is 33,000 square feet in total and includes a two-story office (8,000 square feet per floor) and a 17,000-square-foot warehouse, service bay and fabrication shop.

After groundbreaking in April, the sitework contractor worked quickly to prepare the site by carrying out the site excavation, putting in sewer, retention ponds and building footings. Soon after, Fabcon arrived with the first delivery of wall panels. Flatbed after flatbed rolled through the site, delivering the panels, which were swung into place immediately. Within weeks, the building was fully erected. Then Lakehead's ironworker crews stepped in and placed the steel roof joists to begin closing in the roof. Shortly thereafter, windows, man doors and large overhead doors were installed, and the roof was finished, creating a watertight building. Inside, work continued with underground utilities and stubbing up for the building's electrical and plumbing. Once



the underground work was completed, concrete slabs were poured. Next, the electrical was installed, and plumbing and HVAC duct work went in, along with metal studs. Once everything was roughed in, the sheet-rock crews began sheeting in all the offices and hallways. With about a month to go, the finishing crews laid carpet, began to epoxy floors, painted walls, set acoustical tiles, tiled bathrooms, installed wood finishes, and placed plumbing and lighting fixtures. The two-stop elevator was installed, as well as alarm and fire systems. Just a week before occupancy, the new furniture arrived and was placed in the new offices.

In the first few weeks of occupying the new building, you could feel the energy of being in a new facility. The goals of gaining some new efficiencies were realized, with department coworkers now in adjacent offices, warehouse inventory consolidated into smaller areas, a new shop area layout and more space in the fabrication area. Some of the nicer office features include much more natural daylight and views to the St. Louis River and Duluth from public spaces, new artwork of our recent signature projects, an inviting lobby area for visitors and our salvaged conference room table with a map of the Iron Range and Great Lakes.

One of the final touches on the new office and yard arrived days before our October 10 open house. Our signature Lakehead Constructors taconite rock sign got some fresh new paint for the letters and was proudly installed at the main entrance to our new office.

The finished office, warehouse and shop facility includes:

- Waiting and reception area
- Two large conference rooms
- Private offices – 35 single offices
- Two open areas for cubicle offices
- Elevator
- IT closet
- File room
- Printing and file room
- Kitchen/breakroom
- Coffee bistro area on second floor
- Restrooms
- Locker room
- Warehouse
- 10,000-pound bridge crane
- Vehicle repair bays
- Parts storage
- Fabrication shop
- Cold weather storage
- Equipment yard and laydown
- Completely fenced-in complex

In addition to the Superior site, Lakehead made a \$2.4 million investment in renovating and moving into the former Minnesota Power service center in Aurora, Minnesota, for our Iron Range staff. The new Aurora



facilities sit on a 7-acre site with renovated offices, a new 8,400-square-foot shop, lay-down area and equipment yard.

With two brand new facilities, the future looks bright at Lakehead and we look forward to giving all our valued clients, vendors and "friends of Lakehead" tours of these two great facilities we look to call home for years to come.

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Warroad River Series Compensation Station

BRINGING CLEAN ENERGY TO MINNESOTA

by Brandon Bonderson, Lakehead Constructors Project Engineer

Every summer, Lakehead Constructors is busy providing civil services for electrical substations around the region, and last summer was no different. During August 2019, Lakehead Constructors had several substation projects going on in Minnesota and Wisconsin working for various clients including Minnesota Power, MJ Electric and ABB. Our largest substation project last year was a civil subcontract with ABB for their contract with Minnesota Power to build the Warroad River Series Compensation Station.

As part of Minnesota Power's Energy Forward Plan, which aims to use 50 percent renewable energy sources by 2021, they have increased their use of hydropower in a long-term agreement with Manitoba Hydro. To get additional power from Manitoba to Minnesota, they embarked on installing their new Great Northern 500kV Transmission Line. The Great Northern Transmission Line (GNTL) will enable them to

deliver more than 350 MW of carbon-free hydropower per year from Manitoba Hydro to customers in Minnesota. The GNTL is the United States' portion of the 225-mile transmission line in Minnesota, which provides interconnection at the Manitoba border and runs through the northern part of the state to the new Iron Range Substation outside of Grand Rapids, Minnesota. The hydropower will be generated by the

new 700 MW Keeyask Generating Station on the lower Nelson River as it flows into Hudson Bay, 450 miles north of Winnipeg.

The new series compensation station is located at the approximate midpoint of the Manitoba to Minnesota transmission line. It will hopefully improve the system voltage by connecting a series of capacitor banks on the transmission line. Series compensation increases transmission capacity, improves system reliability and controls voltage regulation. Furthermore, it makes greenfield power transmission projects more cost effective and more environmentally acceptable by reducing the number of lines required. *This is currently one of the largest series compensation stations in the world by capacity.*

Lakehead Constructors was awarded a subcontract to ABB, the prime station contractor that provides the civil scopes of work. We provided project management, safety, QA/QC for the foundation earthwork, concrete, rebar installation, crane support and heavy lifting.



In all, over 100 individual cast-in-place concrete foundations were formed and poured for the station's lightning masts, bypass switches, disconnects, surge arrestors, propane tank, generator, EEE building, ladders, pillars, storage building and breaker control cubicles.

Some specifics: three 38-foot-by-79-foot-by-1.5-foot concrete capacitor footings formed and poured; three 8-foot-by-45-foot dead-end structure drilled pier foundations installed; 165 feet of 11-foot-tall by 8-inch-thick ballistic walls with 2-foot-by-2-foot grade beam; 16 14-foot-deep by 2-foot-to 6-inch-diameter drilled pier foundations.

Other scopes included:

- Excavation and backfill
- Final 4-inch stone/non-conductive rock layer
- Cable trenches – over 1,000 lineal feet
- Electrical grounding grid – 10,150 feet of 4/0 cable
- Critical Lift Plan for 40,000 pounds preassembled electric EEE building sections
- 3,000 lineal feet of underground conduit
- Internal 6 foot chain link fence – 600 feet

This fast-track project, despite its rural location and some significant rainfall events over the summer, was safely completed on schedule.



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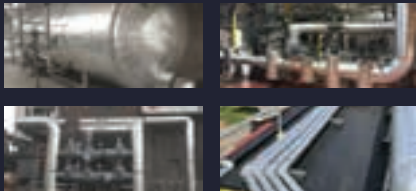
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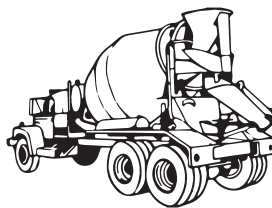
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WLSSD SECONDARY CLARIFIER REHABILITATION PROJECT – PHASE 1

by Kerry Pylka, Lakehead Constructors Chief Estimator

One of Lakehead Constructors' core market sectors is working on water treatment and wastewater treatment facilities, which helps to maintain and improve the water quality in the many communities around our area. On May 9, 2019, Lakehead Constructors was the low bidder for the Secondary Clarifier Rehabilitation Project — Phase 1 (Clarifier 3) at Western Lake Superior Sanitary District's (WLSSD) wastewater treatment plant in Duluth, Minnesota. Project value at the time of bid was \$3.9 million.



WLSSD provides wastewater treatment for Duluth and the nearby communities of Hermantown, Rice Lake, Cloquet, Proctor, Carlton, Scanlon, Thomson, Wrenshall and nine townships. In all, the plant provides wastewater treatment for an area of 530 square miles. Average daily flow through the plant is 48.4 million gallons with a peak flow of 100 million gallons per day.

This project provided rehabilitation for one of the four secondary clarifiers. The clarifier has a diameter of 160 feet with 19-foot-high sidewalls. The clarifier is covered by an aluminum dome.

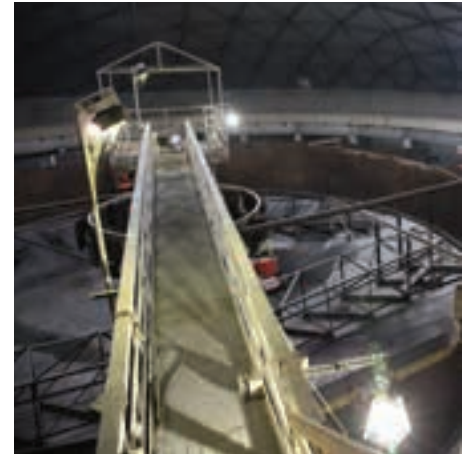
The scope of work included the following: demolition of existing concrete launder troughs, water blasting of interior walls to receive new shotcrete surfacing, clarifier isolation bulkheads, reshaping of exterior grades around the clarifier, new stainless steel launders, new weirs and scum baffles, new interior and exterior drip flashings, addition of an exterior dome access stairway, new ventilation louvers and a cathodic protection system for the clarifier mechanism.

In order to access the work, Lakehead removed enough dome panels to allow for equipment to be lowered down to the clarifier floor via an 80-ton RT crane. Three of the four clarifier rakes were cut and shifted to the inside of the clarifier to provide for perimeter equipment travel.

Steel bulkheads were installed in both the influent and effluent channels to isolate the clarifier while work was being performed. The interior walls and trough support corbels were then water blasted until acceptable pH and chloride levels in the existing concrete were reached. After prepping of the concrete surfaces was done, new shotcrete surfacing was installed. Approximately 15,000 square feet of shotcrete was applied at an average thickness of 2.5 inches to 3.5 inches.

The design engineer, Brown & Caldwell, decided to replace the concrete launders with new 316 stainless steel launders for increased longevity.

Lakehead hired Krech Ojard & Associates to perform 3D scans prior to demolition of existing concrete troughs so the new stainless troughs would match the geometry and elevations prior to demo activities. This ensured that hydraulic balance was maintained between all four clarifiers. New trough weirs and scum baffles were installed after the troughs were set.



A cathodic protection system was installed to increase the life span of coated metal surfaces.

The project had a somewhat aggressive schedule. It began in June 2019 and was substantially completed by the first week of December. This was required to prevent freezing and upheaval of the clarifier structure, as well as to minimize the impact to the plant process associated with having 25 percent of secondary clarification taken out of service.

Since the project specifications required Lakehead to provide a three-year warranty for the shotcrete work, Lakehead hired EPC to provide full-time inspection, testing and construction monitoring to guarantee work was performed to the exacting standards called out in the project documents. The clarifier will be drained down and inspected on an annual basis for the warranty period.

Key subcontractors included Rachel Contracting, who performed the demolition and sitework; M. Lukas Company, who provided shotcrete work; and Parsons Electric, who installed the cathodic protection system.

The remaining three clarifiers will be rehabilitated over the next three to four years.

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