KEARL INITIAL DEVELOPMENT:
BUILDING ON ONE OF CANADA’S LARGEST AND HIGHEST-QUALITY OIL SANDS DEPOSITS

CONTINUING EDUCATION MESA COLLEGE CAMPUS:
OCEAN BREEZES ALL PART OF THE DESIGN

NIAGARA HEALTH-CARE COMPLEX:
ONE MILLION SQUARE FEET OF CARE
THE PROJECT

When fully developed, the Kearl oil sands project, jointly owned by Imperial Oil (the operator) and ExxonMobil Canada, will be one of Canada’s largest open-pit mining operations, with regulatory approval for up to 345,000 barrels per day (bpd) of bitumen production. It is estimated that Kearl has the potential to produce about one in every eight barrels of oil in Canada, based on today’s production levels.

The first phase of the project, known as Kearl Initial Development, aims at developing six oil sands leases located 70 kilometers north of Fort McMurray, Alberta. The client employed a phased development strategy to leverage learnings gained at every step through their “design one, build many” approach to facility replication.

When Imperial Oil and ExxonMobil Canada tendered a contract for the expansion of the Kearl project, PCL was successful in securing a second lump-sum contract with an almost identical project scope.

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PHOTOS: The Kearl Initial Development will be one of Canada’s largest open-pit mining operations.
During the first phase, PCL’s scope of work consisted of bulk procurement, fabrication, module assembly, and site construction. This included the assembly of 134 modules, the erection of four steam boilers, and the construction of a water treatment plant, two ponds, and a 72 kV electrical distribution system. Work, which started in the field in January 2010, was completed in April 2013.

PCL Industrial Management Inc. secured an agreement to execute work on a utility plant for the Kearl oil sands heavy oil extraction facility under a lump-sum contract. Under this contract delivery method, PCL assumed responsibility for labor productivity and the schedule, while the client was accountable for quantities and camp and travel costs.

PCL’s project sponsorship model is founded on the “one call away” principle, which strengthens communication between the clients and PCL’s staff and executive. Key project staff and senior executives are available to clients 24/7; PCL Industrial believes strongly in the importance of giving clients access to executive authority whenever required.

“Kearl is the largest project Imperial has ever undertaken, and we knew that selecting the right organizations to build it was a critical success factor. The working relationship at all levels of our two organizations has been a high point,” said Chris Allard, Kearl project executive.

“PCL and ExxonMobil/Imperial Oil have similar company cultures when it comes to the value placed on long-term relationships,” said Peter Stalenhoef, PCL Heavy Industrial. “Exxon and Imperial Oil set high expectations, and they are unique in the way they operate. They realize it takes time for strong relationships to be forged, and they invest in these for the long term.”
From Nisku to Kearl

PCL Industrial Constructors Inc. was responsible for pipe fabrication and module assembly for the utility plant, most of which was performed in Nisku, Alberta, and shipped to the Kearl site 600 kilometers away. Assembly included the installation of pipe spools, electric tracing, insulation, equipment, power, and control wiring. Off-site module assembly greatly reduces workforce requirements, can proceed concurrently with site work, and significantly reduces overall cycle time to complete the project. Productivity is improved and costs are lower due to reduced scaffold needs, improved site access, reduced congestion, less trade stacking, and the avoidance of camp and travel costs.
THE PROJECT

The Continuing Education Mesa College Campus (formerly the Clairemont/Linda Vista Campus) serves San Diegans with a variety of curricula including English as a second language, brain-injury redevelopment programs, parent-child courses, and programs for adults age 55 and over. The campus is part of the larger San Diego Community College District (SDCCD), a leader in efficient building. Lean construction principles that maximize value and reduce waste are integrated into all district projects.

Sustainability is a priority for SDCCD. Fourteen College facilities have been LEED certified, and the district hopes to bring that number to forty-one. One way to achieve a LEED rating in the San Diego area is to allow local prevailing winds to cool buildings. SGPA Architecture and Planning did just that, taking advantage of Mesa College’s spot at the top of a hill, seven miles from the Pacific Ocean.

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PHOTO: The Continuing Education Mesa College Campus will provide space for the consolidation of programs offered in temporary classrooms at a nearby high school, churches, and surrounding community sites.
An integral part of the building’s natural ventilation system is intelligently controlled windows of Danish design. Outside air moves through the occupied spaces, into the corridor, and out through the clerestory. The windows can be operated by a wall switch in each classroom or remotely using the Building Management System (BMS). This technology required extensive coordination between trade contractors to ensure that multiple components would work together.

A sample window motor was installed on an exterior mock-up and then bench tested with the BMS early on. To ensure adequate airflow through the building, the team also mocked up and then air tested the curved corridor metal ceiling panel, which was designed as a “wind scoop.” Based on the information gained, the mechanical engineer used a computer model to determine the optimal window-motor sizes.

A physical mock-up can be a useful analog to the Building Information Modeling tools used on many projects today. The mock-up of Mesa College uncovered potential complications with the alignment of exterior finishes. The architect’s intent was for the finish materials—exposed structural tube steel, exterior and interior wall-panel reveal system, window mullions, stainless steel guardrail posts, and tile grout joints—to align using an 8-foot grid system. The mockup showed that when typical construction tolerances were accounted for, the building’s finishes would not align as shown on the computer model. Analyzing the exterior mockup allowed the project team to subtly alter the exterior detailing and resize some windows to solve any incongruities and preserve the intent of the design.

"Quite a few installations were challenging and new to the San Diego Community College District," said Scott Ellis, SDCCD project manager. “In addition to the passive ventilation system, custom-engineered Renlita doors used in several areas took quite a bit of teamwork because several trades were affected. The PCL team did a great job with regard to coordination. Overall the entire project had very few issues, and was completed within budget and on schedule.”

PHOTO: The 38,000-square-foot building features classrooms, an art lab, a parent-child area, and a multipurpose room and administrative support space.
The Niagara Health System (NHS) New Health-Care Complex is a 980,000-square-foot acute care community hospital that replaces two aging facilities in the Niagara region. The facility accommodates 375 acute care beds, with associated outpatient and support services, and provides a comprehensive range of clinical services. Built to achieve LEED® Silver certification, environmental features include energy efficient lighting, cooling, and heating, which help to reduce greenhouse gas emissions.

PCL is a member of the consortium awarded this project, consisting of Plenary Group, Borealis Infrastructure, PCL Constructors Canada Inc., Bregman + Hamann Architects, Silver Thomas Hanley Architects, and Johnson Controls. The new hospital, recently completed on time and on budget, is setting national standards for hospital design.
Building Success with Passion and Care

When PCL’s general superintendent, Dean Xuereb, talked to his mother, Patricia, about the new Niagara Health System (NHS) Health-Care Complex in their home town of St. Catharines, he would often talk about the state-of-the-art construction details.

It was Patricia, just before she passed away, who reminded Dean and the rest of the team that it wasn’t the building that mattered most; it was what would happen inside those walls. “One million square feet of care,” she said. This message became a challenge for the project team, and for NHS staff, remaining a guiding principle throughout design and construction. Now, with the same care and passion that Dean and his team put into building the facility, NHS staff are transitioning to their new hospital and preparing to provide the Niagara region with one million square feet of care.

New Project Delivery and User-Focused Design

This building is the first true Design, Build, Finance, Operate (DBFO) project to be delivered under the Government of Ontario’s Alternative Financing and Procurement (AFP) program. As a result, the design process was relatively uncharted.

The vision: to design and construct a nearly one-million-square-foot building capable of providing one million square feet of care.

The team developed an extensive design process with more than 300 NHS clinical staff and related health agencies, which generated dialogue around what the hospital really wanted. Incorporating their input into the final design resulted in a building that is focused on the patient experience and outcome, and provides a more efficient footprint that strategically locates departments to minimize clinical travel time by staff.

The facility also includes an innovative design approach for the cancer centre to help patients feel less isolated by using high-density hematite block construction and special hallway configurations that eliminate the need to physically seal the radiation suites.

Extensive Infection Control Safeguards

The hospital was required to be built with the highest degree of infection control safeguards. One of the construction methods, a first in Canada, involved lining the operating suites with corian walls for improved infection prevention and control. A revolutionary HVAC system ensures the building can be isolated into separate horizontal and vertical zones in the event of a pandemic, at the touch of a button. The facility also features impressive automated control systems that operate heating, cooling, pressurization, and air exchange to support infection control standards and general comfort levels. Eighty percent of the rooms are single patient, the highest proportion currently available in a community hospital in Ontario.

“This project required that PCL manage a design-build process that incorporated the input of dozens of hospital departmental user groups. The integration of the design-build process, while maintaining a very aggressive construction schedule, was one of the most complex and difficult projects I have been involved with in my 45 years in the industry in eastern Canada.”

D.R. Swackhamer
Sayers Modern Niagara Inc.
The PCL family of companies is a group of independent construction companies which carry out diverse operations in the civil infrastructure, heavy industrial, and buildings markets.