

## AQUATICS AND RECREATION CENTRE CONSTRUCTION

# CHANDOS CASE STUDY

Aquatic and recreation centres are vital to communities, offering the opportunity for fun and physical activity for all ages. Surprisingly, there are only about 3,700 public swimming/splashing facilities in Canada, many of them built in the 1970s and 80s or earlier. With so many aging facilities across the country, there are dozens of recreation centre renovation projects underway each year.”

“For aquatic renovation projects, a lot of investigation is needed,” explains Dominic Ries, director of Technical Solutions at Chandos. “Decades ago, the concrete technology and methodology wasn’t as reliable as today. We often find that the methods of pool building back then did not have the same type of building science acumen that projects have now. As a result, renovations often have hidden surprises, such as interesting locations for pipe runs, water stopping techniques, and potential concrete deterioration when in contact with chlorinated water. In some cases, it is crumbling behind the tile walls. You never know what’s going on behind the surface.”

That was a challenge for the team on the Canada Games Aquatic Centre in Kamloops, BC. The project involved replacing the building envelope; mechanical, electrical, and HVAC systems; and hot tub, sauna, and steam room, was originally meant to resolve some issues common to older facilities. With 30 years of experience with aquatic facilities, Ries was quickly able to identify some root causes of the issues and support the client in identifying that more investigation needed to be done.

“We’re not going to build on top of something that’s not going to hold the new build,” Reis says. “If it’s a structural, safety, or code issues, we

bring it up to the owner immediately. Then it’s a team effort—what can we do in terms of budget and schedule to deliver the facility back to the owner, and the community.”

Drawing on extensive knowledge of such facilities, the team working on the Kamloops project was able to pinpoint the open design of the building as one of the culprits for its degradation. While current designs champion the requirement to create barrier-free facilities that promote inclusion, some of the innovative layouts of the past didn’t always take into account the need for increased fresh air ventilation, exhaust, and environmental barriers around natatoriums that help to prevent humidity and the byproducts of chlorine from impacting the building envelope.



Bonnie Doon Leisure Centre | Edmonton, AB

“Pools need to have their own ecosystems” Ries adds, “It’s for the respiratory health of the Lifeguards and patrons swimming, as well as keeping the humidity and efficiency of building operations.” Barrier free solutions were brought forward during the design phase to ensure that inclusive designs were being included in the final build.

“As soon as you walked into the Canada Games Aquatic Centre, you felt damp and smelled chlorine. There was moisture in the change rooms, on the window ledges, and even the outside walls, and the roof membrane was saturated and rotting,” says Leah Ulliyot, project coordinator, explaining the depth of the issues.

The team kept the open feel of the building by opening up the change rooms to create one large change room and using glass partitions to separate areas in the recreational space. They also created an environmental barrier around the pool area to keep the rest of the building dry and free of the smell and damage done by the byproduct of chlorine.

The result? The building will last longer and users have a more pleasant experience. Using Integrated Project Delivery (IPD) as the delivery method allowed for collaboration with all teams to ensure that the complex project led to a successful outcome. The City of Kamloops was the first municipality in British Columbia to pursue and complete a project by way of IPD.

When constructing pools, it’s important to take geotechnical information—the engineering behavior of earth materials—into account. For the 38,000-square-foot Prince George downtown

aquatic center, which is being built on a site that has seen multiple uses, this was critical.

“The city is situated on an ancient riverbed, so the soils are very active. The water table can rise up to the finish grade. We also found old fuel tanks and organics put there from old foundations. It all had to be removed and replaced with engineered fill,” says David Addisson, senior project manager.

Another common issue with pools is hydrostatic lift. The pressure of underground water can cause the pool to crack or even rise out of the ground. To prevent this on the Prince George project, the team completed a monolithic pour of the concrete pool—one pour so the whole pool moves as one to prevent shifting that could crack the base.

Hydrostatic lift caused challenges in the renovation of the Confederation Leisure Centre in Edmonton, AB, another Construction Management project. It’s deep dive tank extended below the water table and the pressure caused cracks and seepage into the tank.



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Dominic Reis  
Director of Technical Solutions  
Chandos Construction





Maple Ridge Leisure Centre | Maple Ridge, BC

“Our solution is dewatering outside the building. In other cases, we’ll have piles underneath to suspend the pool. It’s a matter of considering the engineering requirements and having discussions with the geotechs and building designers,” explains Ian Griffiths, project coordinator.

As is common with aquatic centre renovations, the project team didn’t know what they would find on the Confederation project. “In older buildings, you’ll often find that what’s really there is different than in the record drawings,” says Addisson. “With swimming pools, this can be a big problem as there are hidden issues you need to identify early.”

It’s important to have the right trades—those who will add value and work collaboratively on each project. This means involving all team members from the start. For example, bringing in the tile team early to find out what they need other teams to complete prior to ensure they are successful. To prevent rework, we do a flood test before the tile is put on, ensuring we meet the health code for deck drainage. Then once determined that everything is correct, the tile setter can continue.

When it comes to aquatics and recreation centres, functionality and looks aren’t the end of the road. These facilities have to be user-friendly and, most importantly, safe.

That means going to the extra mile. When the project is ready for the final health inspection we will do a preliminary guest safety check by taking our boots off to do a barefoot walk on the pool deck to ensure no one is going to get hurt by a sharp piece of tile or other potential danger.

“We’ve done over 26 recreation projects in the last three years,” says Ries. “Each project allows us to get better at what we do and get better with our trade partners. Everybody on our team has met with challenges and come up with solutions that will only make the next project go that much more smoothly.”

## TESTING, TESTING, 1,2,3

Swimming pools need to be watertight and we make sure they are—before the waterproof membrane is put in. After the concrete has cured, we fill up the pool to ensure it's going to hold water. This static test is an important step to make sure our teams have installed the concrete and fittings correctly and we are not just relying on the waterproof membrane or coating for pool integrity. When planning the pool, we look at tolerances for the building code and the health code, as well as its operational future. The goal is to ensure the facility is going to last for decades to come.

## THE FULL PICTURE

Our team specializes in multiplex facilities where specialized building sections play a big part in the overall facility programming. In some recreation centres, artificial turf, running tracks, and indoor soccer centres can lead to the need for outside the box thinking. Experience has taught our team that when placing specialized products or equipment on site, it is important to think through all elements. An example of this on a previous project was during the implementation of artificial turf and the chronic landscaping issues that can occur around the building because of this product. The rubber pellets and sand mixture from the turf that fell during installation, on and off the field, began to kill the surrounding grass and trees.

Learning from past projects allows us to help clients avoid future issues. Everything inside a

building needs to have a purpose but you also have to consider how it will impact everything around it. Our team looks at facility operations, and future proofing for site management.

## COMMITTED TO COLLABORATION

A big issue with pool projects is that you never know what you're going to find once you start taking the old structure apart. For example, a pool can need re-tiling, but once the old tile is removed, you might find that the gutter is on an unstable substrate. There's no point putting new tile on if it isn't going to last, which means that the project needs to begin lower down, on a more secure substrate concrete. When using the technique called chaining or sounding, you can find hollow sections of concrete or concrete degradation from exposure to sulphates or chlorines. As a result, it may be determined by the structural engineer that the walls aren't in good shape and need to come out and be re-poured.

That's where Chandos' commitment to collaborative construction makes a major difference. With early involvement of all parties and open sharing, everyone has the information they need to make informed decisions and get the job done right.



Canada Games Aquatic Centre | Kamloops, BC