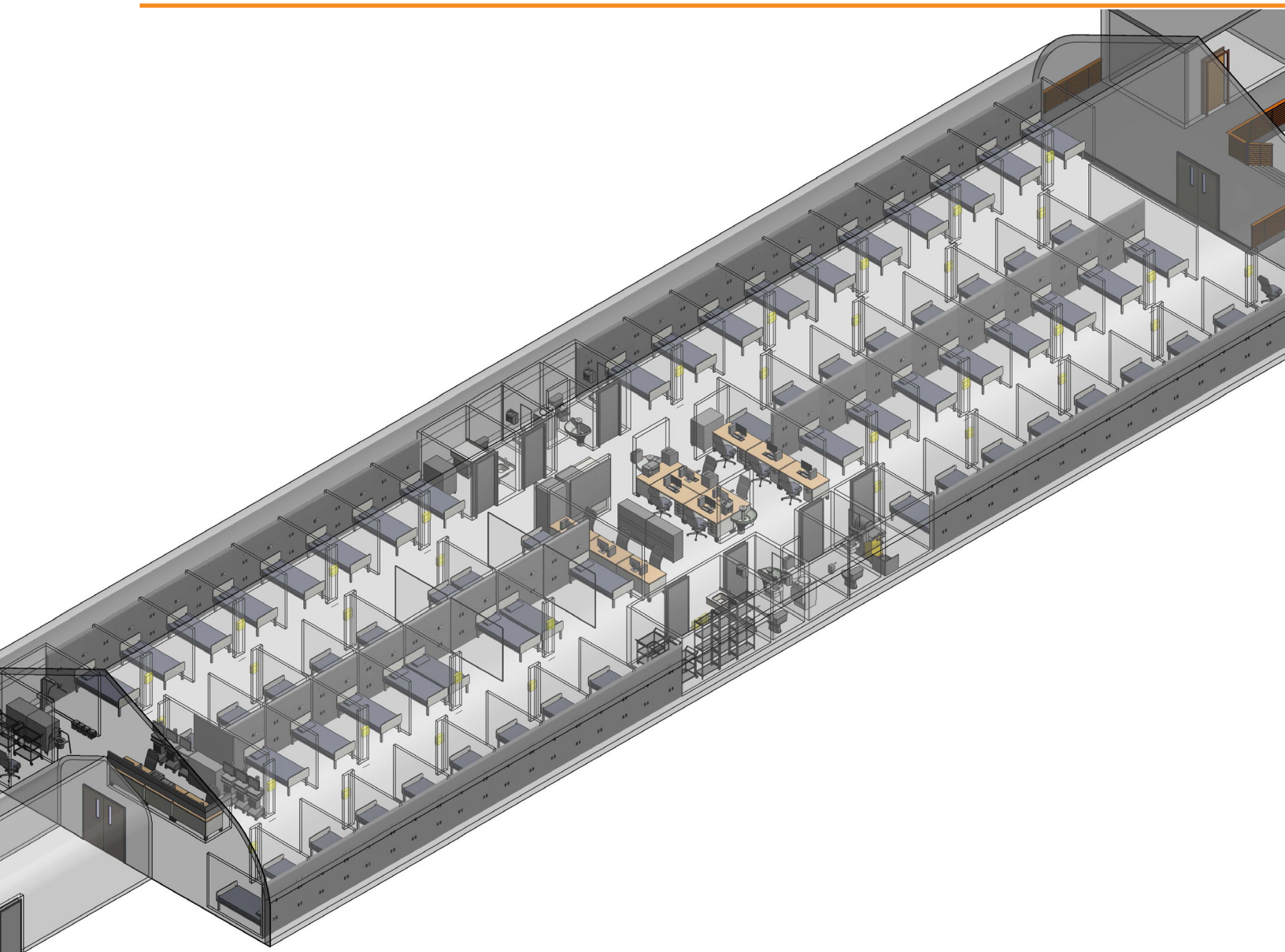
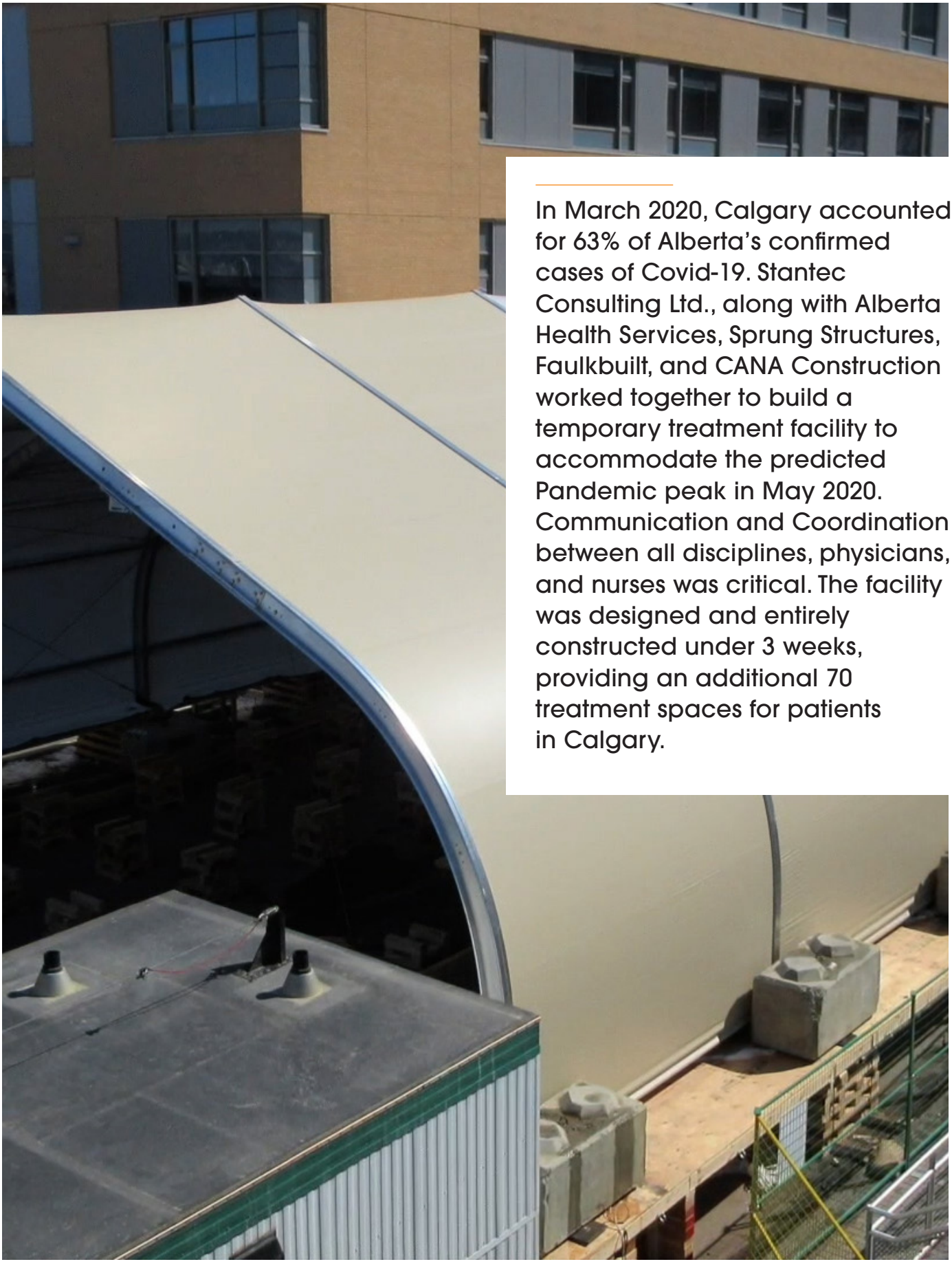
Stantec

2021 CANADIAN CONSULTING ENGINEERING AWARDS

PETER LOUGHEED CENTRE TEMPORARY COVID-19 TREATMENT FACILITY





In March 2020, Calgary accounted for 63% of Alberta's confirmed cases of Covid-19. Stantec Consulting Ltd., along with Alberta Health Services, Sprung Structures, Faulkbuilt, and CANA Construction worked together to build a temporary treatment facility to accommodate the predicted Pandemic peak in May 2020. Communication and Coordination between all disciplines, physicians, and nurses was critical. The facility was designed and entirely constructed under 3 weeks, providing an additional 70 treatment spaces for patients in Calgary.


PETER LOUGHEED CENTRE
Pandemic Response Unit
CLIENT
Alberta Government
Alberta Health Services
DONOR
DESIGN PARTNER
Stantec
CONSTRUCTION PARTNERS
CANA
FALK
BOTTING
ACUTECH
EngA
ENGINEERED AIR
BOTTING

PROJECT HIGHLIGHTS

INNOVATION

A temporary facility located at the Peter Lougheed Centre was designed and constructed to house up to 70 additional patients and add over 750 square meters of treatment space during the Calgary's first wave of the Covid-19 Pandemic.

Team collaboration between the engineering disciplines, architecture and stakeholders was critical in accomplishing the main goal – to treat the affected with dignity, while protecting the public, and diminishing the spread of the Covid-19 virus.

Working under pressure during this time was an understatement. At the time, the COVID-19 virus was not well known, and we were faced with conflicting research of the virus. The World Health Organization suggested the virus was transmitted by droplet only, whereas subsequent studies indicated the possibility of airborne transmission.

We designed the ventilation system with airborne transmission in mind, configuring the airflow to travel from clean to dirty, with fresh air supplied near healthcare workers and exhaust grilles close to the patient. The system was configured as a 100% outside air system, with no recirculation, and utilized an up-blast exhaust fan to prevent entrainment of exhaust gases back into the building.

Government predictive modeling projected that the first wave would peak and then begin declining within three months, so the building was intended to have a very short-term use. We had the foresight to design the building to be easily winterized by including insulation and heat tracing of all drains and water lines susceptible to freezing. We also designed the air handling units with sufficient heat to operate in the winter. As the pandemic proceeded and the facility was in fact required during the winter, the building structure was retrofitted with insulation to complete the winterization process.

Aside from it's function, the project process is distinguishable based on it's extremely fast-tracked schedule, collaboration of teams, and charitably of time and passion by all who were involved. This project was a first for our team, and a first for Alberta Health Services and the Government of Alberta because if it's urgency. Even though it is a temporary structure, it operates much like a fully functioning hospital. Unlike other Alternative Care Facilities that have been built in convention centers during this pandemic that only provide bed space, this project provided a fully functioning hospital unit, including medical gases, proper air exchange rates, nurse call and a direct connection to the hospital's Emergency Department.

PROJECT HIGHLIGHTS

COMPLEXITY

One of the biggest conditions our team was faced with, was working together virtually in a scary and unprecedented time. As the pandemic was quickly spreading throughout Calgary, many people experienced heightened mental and physical health concerns. The design team was forced to execute this work in an unproven and unfamiliar arrangement, with all of our team members working from home and collaborate with each other via video conferencing for the first time.

The safety of our team, the construction workers and medical staff of the Peter Lougheed Centre was paramount. At the time, safe work COVID protocols were still in development. Masks were a hot topic of discussion because nobody knew which mask would best protect those physically involved in the project. There was a shortage of medical grade N95 masks, and fabric masks were not yet something that could be purchased in bulk. The decision was made for those building the structure to wear the N95 Respiratory mask (used in dusty conditions) at all times, and to maintain physical distancing when possible.

The project also ran into material supply and availability challenges. Where possible, we worked closely with contractors and suppliers to specify materials that were already in stock in town. Luckily, all entities contacted on behalf of this project expedited their work to meet schedules. We worked closely with a local air handling unit manufacturer who emptied their production line and were able to supply their units in 8 days, much faster than the typical 16 weeks.

SOCIAL/ECONOMIC BENEFITS

As of April 2020, the entire province of Alberta was in lockdown, and everything except essential services were shut down. Nearly all construction projects were impacted, with many being put on hold during that uncertain time. Having this project move forward during this time of slowdown had a positive impact on the local economy.

The speed of project delivery was very unconventional and although there were additional costs associated with overtime and expediting delivery of building materials, this effect was offset by the cost savings of a significantly shortened schedule. Alberta Health Services

provided strong leadership through consensus building and providing quick decision making. The proposed floorplan was signed off by clinical users in only 2 days, typically an iterative process taking months. This project demonstrated that strong project management with minimal red tape and quick decisions can lead to significant savings and its model can be adapted to future projects.

Socially, the facility has provided some peace of mind for healthcare workers and the public during this pandemic. With 70 new additional bed spaces and treatment areas, the fear of hospital capacity while the numbers continue to grow has been slightly adjusted.

ENVIRONMENTAL BENEFITS

The main benefit of a temporary facility such as the one built at the Peter Lougheed Centre, is that it can be re-used or re-purposed for a variety of different circumstances. In the future, our team knows that the Peter Lougheed Centre will be renovating their Emergency Department. We designed the temporary facility to be attached to the Emergency department for treatment convenience, but also because it can be used as de-canting space when construction of the Emergency Department is underway.

When the facility eventually gets dismantled, it can be redeployed at other AHS sites and be used for decanting spaces for other hospitals or temporary emergency shelters. Other components have been selected to have flexibility for reuse, including the air handling units, medical gas alarm systems and outlets, lights, medical equipment, and movable partitions.

The facility was designed to limit the spread of the virus within the hospital and to the surrounding community. Although physically connected to the main hospital, the PRU is negatively pressurized to prevent contaminated airflow from entering the hospital. Exhaust systems have been designed to have HEPA filters installed and a high plume stack prevents any re-entrainment of air back into the PRU or the main hospital. Clinical design allowed for personal protective equipment don and doff stations for proper COVID protocols of healthcare workers.

MEETING CLIENT'S NEEDS

In the early days of the COVID-19 pandemic when Alberta was still climbing the curve, the Province of Alberta predicted that a total of 2200 beds would need to be available to address the surge. Many of these came from cancellation of elective surgeries. However, the province still needed to find additional space. Stantec teamed with a local building fabricator, Sprung Structures and contractor, Cana Construction to develop a project to support this need.

Stantec's healthcare knowledge and expertise allowed for a remarkably short two day turn around to get a plan developed and signed off by AHS. Through our buildings team's experience in healthcare, we collaborated closely with AHS clinical planners to bring decisions to a quick close while determining details on equipment, millwork, finishes, mechanical and electrical. Working directly with key user groups including physicians and nurses, the facility was designed to ensure the temporary centre supported AHS treatment practices while keeping patients and healthcare providers safe.

The project was also a demonstration of conquering adversity from every team. With everyone working from home in an unprecedented time, the typical hierarchy of a project was diminished and everyone came together to solve issues. As well, access to the hospital grounds was—and still is—extremely limited and closely monitored.