

# A vertical convention center stacks up in Seattle

By ANNE MARIE MOELLENBERNDT and LEONARDO DA COSTA  
Special to the Journal

Located at the crossroads between several of the city's most iconic neighborhoods, the Seattle Convention Center Summit building represents a transformative opportunity for revitalizing and reconnecting Seattle's vibrant downtown core. Acting as a catalyst for improvements to the local community, the new convention center building aims to provide a rich urban experience, unique to Seattle, for both visitors and residents.

## THE VERTICAL STACK

The project represents a significant shift in the events industry model. The vertical organization of the building's program — the first high-rise convention center in North America — combined with a variety of highly flexible event spaces provides maximum efficiency and flexibility for an array of different uses, from single large shows to a variety of concurrent visitor and community events.

This unique vertical stack design presents several advantages. Its compact footprint integrates into the heart of the urban core, allowing easy pedestrian connections to nearby hotels, restaurants, shopping areas, and cultural attractions. The optimization of the limited site footprint provides a more compact and efficient plan layout, substantially reducing the distances between different parts of the building and allowing the new building to offer distinct ways to organize and perform events, large and small. The location and arrangement also reduces the need for parking due to the existing and future transit connections to the surrounding community.

The convention center's program is distributed across six levels of event spaces, including two exhibit halls stacked one above and one below-grade. Multiple at-grade entries connect to a registration level between the two exhibit halls. Above are two meeting room levels and an industry leading 58,000-square-foot ballroom. Every event space incorporates natural daylight and the six levels are connected vertically through two large atria. Visual connectivity between event floors and individual areas of

the building helps orient attendees as they navigate the various levels through dramatic vertical spaces.

Large expanses of glazed walls around the building's perimeter contribute to an abundance of natural light inside. This increased transparency promotes a synergistic connection between the building and the city. The action inside the venue gets showcased to the city, while the energy and activities happening on the city streets and nearby buildings become part of how visitors experience the events inside. A garden terrace brings visitors outdoors to further this connection. When viewed together, all of these elements improve comfort and provide a sense of well-being for conference-goers.

## DESIGN CHALLENGES

The vertical stack configuration also created some challenges for the design team. There was a three-dimensional puzzle to solve as the egress stairs zig-zag back and forth as they transition down from one horizontal slice of the building into the next. Routing all the air conditioning, power and water from a central location would have been inefficient and impractical, so building systems and equipment needed to be distributed throughout the building — in mezzanines, corners and niches at all levels. On top of these normal building systems, massive bespoke smoke control systems serve much of the building spaces, to ensure safe occupant egress in case of a fire.

All of these have been integrated behind the scenes, ensuring a visitor might never guess the complexity of the spaces, structure, and systems that allow these large volumes to stack and connect so seamlessly.

The atria also presented unique design challenges. Large glass facades can create thermal comfort issues in both sunny and cold conditions, so the design team applied advanced analysis tools to model airflow in the atria, eliminating stagnant air and hot zones or cold drafts. Air supply is carefully integrated and hidden at the edges of the mezzanine levels and above the unique hanging wood ceilings at the top of the hillclimb. The radiant floors that provide a first stage of heating and cooling to all the prefunction and lobby areas even extend



Radiant floors extend into the wooden hillclimb seating stairs.

Photo copyright Cory Parris Photography

into the wooden hillclimb seating stairs.

The demand for increased density and tall, more efficient buildings is making a mark on urban centers around the world. With its striking architecture and multiple levels, the Seattle Convention Center Summit building offers a sense of excitement and innovation that enlivens Seattle's skyline. The venue is designed to be a contemporary emblem for the future of urban meetings and events, contemplating how people interact in today's world and creating a space where people can experience the culture of Seattle's distinctive urban core.

*Anne Marie Moellenberndt, an associate principal and mechanical group leader of Arup's Seattle office, has over 20 years of experience as a mechanical engineer and project leader. LMN principal architect Leonardo Da Costa has 21 years of design experience, with over 15 years of focus on convention center projects.*



Every event space incorporates natural daylight through expansive windows.

Photo by Adam Hunter/LMN

## SUMMIT ADDITION TEAM

### Owner:

Seattle Convention Center

### Developer/owner's rep:

Pine Street Group

### Architect:

LMN Architects

### Contractor:

Clark Construction Group and Lease Crutcher Lewis joint venture

### Structural/civil engineer:

Magnusson Klemencic Associates

### MEP engineer/fire code consultant:

Arup

### Mechanical contractor:

MacDonald-Miller Facility Solutions

### Steel erection:

American Bridge

### Electrical infrastructure:

VECA Electric & Technologies

## SUMMIT BY THE NUMBERS

573,770 square feet of event space

62 meeting rooms

58,000-square-foot ballroom

3,900 suspended planks of reclaimed wood in ballroom

12 giant window shades (63-by-10 feet) in ballroom

14,000-square-foot Garden Terrace

19 elevators; 42 escalators

18 covered loading dock bays

Built with 21,000 tons of steel;

95,000 cubic yards of concrete

Supported by 8-by-24-by-24-foot

concrete spread footings

About 26 miles of plumbing pipes

About 99 miles of PEX pipe for radiant floor heat

380,000 cubic yards of excavation



Photo: MacDonald-Miller

## SEATTLE CONVENTION CENTER ADDITION

The largest building in MacMiller history.



Photo: ©Adam Hunter, LMN Architects

MacDonald-Miller is proud to partner with Clark Construction Inc, Lease Crutcher Lewis and LMN Architects to bring the Seattle Convention Center's Summit building to completion.

Thank you to everyone that worked on this transformative project. From our highly skilled union crews to our internal support teams, we're proud of the work you do.



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WASHINGTON & OREGON

# Summit building — an epic project for local contractor

By **NICOLE MARTIN**  
MacDonald-Miller

The Summit building at the Seattle Convention Center, the largest single building ever worked on by MacDonald-Miller Facility Solutions, is now open. With a contract value over \$100 million, and several years of preconstruction work, MacDonald-Miller began on-site work at the convention center addition in September 2019, setting the first four of 35 air handling units. After more than three years of construction, the building opened to the public two weeks ago.

## CONSTRUCTION

MacDonald-Miller was selected for this complex project based on its project team experience and prefabrication expertise. That experience allowed it to take an integrated approach to the design and building information modeling of the project. When considering early preconstruction efforts, MacDonald-Miller worked on the project since 2016, when the scope included providing and installing all the HVAC systems, including mechanical piping, sheet metal and controls. The size and scope of these systems is incredible, with many duct sections bigger than a full-size train car. The project includes more than 1.6 million pounds of ductwork, with many long runs to accommodate the exhibition halls and gathering spaces. Some of the ductwork is more than 20 feet wide.

The most unique aspect of this project included prefabricating a 4,000-ton central plant, creating complex life safety systems, and using a unique construction method due to the large building footprint, which required the steel structure to be installed in phases and presented several sequencing challenges.

## TEAMWORK

Due to the sheer size, the project was a challenge from the start. "With 1.5 million square feet of single rooms spanning multiple city blocks, the construction sequence and logistics of this project are like nothing else in the country," said Ryan Hunter, project manager at MacDonald-Miller.

"Adding the hurdles of the pandemic hitting during our peak crew size, a concrete strike, and challenging labor and procurement markets, the level of difficulty only increased. These challenges were met head-on by the project team, and we executed them with distinction," said Hunter.

## LOGISTICS

Most construction projects start on the ground and move up, so one of the biggest challenges of this site was that it was built in a billboard sequence. This unique plan organized the construction into five towers or "billboards" lined up in a row, to brace one another and support the load. Area one went up first, then area two, and so forth, until all 14 levels were completed.

Another aspect unique to the project was that the scaffolding was not as permanent as it may have been on other sites. It sat in place for a day or two to load materials and then moved to a different location for walls to proceed.

During preconstruction, detailers from MacDonald-Miller co-located at the Arup engineering office to model the systems in 3D to speed up the design and coordination process.

Collaboration was vital with engineers, detailers, and project managers all together in a room to resolve constructability issues early, which allowed MacDonald-Miller to prevent problems that would have been very costly

to fix later. "Problems could have become serious later in the game had we not talked about them," said Reagan Perry, principal in charge at MacDonald-Miller. "For instance, the early design had single-coil air handlers that would have required very large headers. Our detailers saw that we could reduce costs and field piping by utilizing dual-coil air handlers and maximizing prefabricated headers."

Rigorous constructability reviews allowed MacDonald-Miller to manage adjustments before the air handling units had been procured or installed.

MacDonald-Miller's detailing department paved the way for success, creating thousands of work package deliverables. Due to the size of the floor plate, each level had to be broken into 15 separate drawings and included about 250 separate install drawings per trade.

"Our fabrication, logistics, and field teams performed phenomenally for this project," said Rylan MacCay, operations manager at MacDonald-Miller. "Ensuring the fabrication was accurate and that it arrived on site when the crews needed it was an enormous undertaking. Our team made over 2,800 deliveries to the site with fabrication, equipment, and other materials." The sheet metal shop and crews from Sheet Metal Workers Local Union 66 fabricated, delivered, and installed more than 1.6 million pounds of ductwork.

MacDonald-Miller's pipe-fitting crew from U.A. Plumbers & Steamfitters Local 32 installed, tested, and flushed more than 15 miles of hydronic piping, and 100 miles of polyethylene tubing for radiant floors.

The building automation system was another giant undertaking for this massive building. MacDonald-Miller started this scope of work in 2018 with engineering and will complete programming checkout and commissioning this April, making this portion of work a four-and-a-half-year project. The building automation system, especially for a building of this size, allows the building engineer to quickly assess the condition of the building. Building engineers can see the hot or cold zones and adjust temperatures with a "click of a button" if there is a problem.

The controls system also archives trending data that can be pulled to help troubleshoot equipment or comfort issues. In all, the MacDonald-Miller Honeywell BAS system controls and monitors HVAC, plumbing, mechanical and electrical systems for the 1.5 million-square-foot facility, serving as the "eyes" and "ears" watching over the HVAC system and will alert the maintenance team when issues arise.

## SAFETY

Most importantly, this work consisted of more than 797,000 labor hours, and was executed safely with a recordable incident rate of 0.5. To put this into perspective, the national average recordable incident rate in the construction industry is 3.9. "We did a fantastic job out here on safety. It is unheard of. It would be like if four people worked a full 40-year career and only one of them had a recordable incident," Hunter said.

MacDonald-Miller would not have been as successful on this project without the immense preplanning and collaboration of all team members who were focused and committed to delivering this new space for both the local community in Seattle, as well as the many visitors who will enjoy what the Summit has to offer for years to come.

*Nicole Martin is brand and communications manager at MacDonald-Miller.*



The Summit addition was MacDonald-Miller's largest single building contract ever.

Photo copyright Adam Hunter/LMN



Dual-temperature air-handling unit coil connections, in the foreground, supply the air header in the background.

Photo by Gus Simonds/MacDonald-Miller



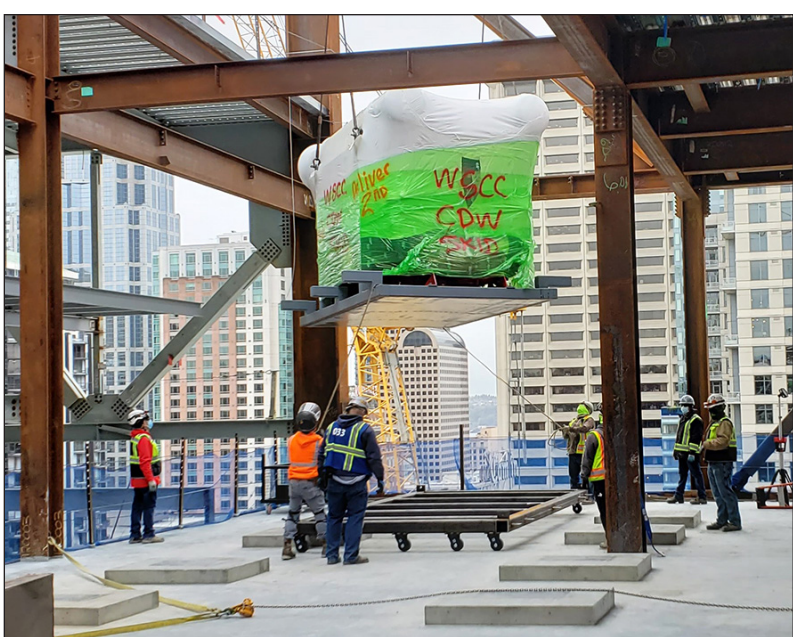
## A Structure Built on Enduring Partnerships

The Summit Building at the Seattle Convention Center is open for business!

The construction of this mega-project was a true team effort, made possible by an unwavering commitment to collaboration. Clark/Lewis would like to thank all of our valued project stakeholders, including Pine Street Group and the Seattle Convention Center, LMN Architects and their design team, and the Seattle Building and Construction Trades Council and our trade contractors, including dozens of small and diverse local businesses.

The hard work, talent, and dedication this team brought to the job each day made this project a success.

**CLARK** **LEASE CRUTCHER**  
**CONSTRUCTION** **LEWIS**  
A JOINT VENTURE



Crews hoisted prefabricated condenser water pump skids to level 12.  
Photo by MacDonald-Miller

# Reimagining jobsite diversity and inclusion at Summit

By GARY SMITH and BRETT EARNEST  
Special to the Journal

The construction industry is not known for its diversity. In fact, according to the U.S. Bureau of Labor Statistics, in 2022 the construction workforce was 89.1% male and 87.3% white.

The pandemic, and the recession it precipitated, hit hardest in some of Seattle's most challenged communities, which also happen to be areas with the most diversity.

For the past five years, Clark Construction Group and Lease Crutcher Lewis (Clark/Lewis) have been constructing the Seattle Convention Center (SCC) Summit project, a 1.5 million-square-foot standalone gathering space in downtown Seattle. Now complete, the building doubles the convention center's event space and elevates Seattle's position as a premier convention destination, spurring tourism and boosting the local economy in a time of immense need.

SCC, Clark/Lewis, and developer Pine Street Group partnered at the project's onset to ensure the hiring of a diverse workforce, especially those disproportionately affected by economic adversity. The goal was to impact the local community — helping ensure that people of all races, ethnicities and genders received opportunities to work and thrive in the construction industry.

The project's emphasis on diversity was aided by the passion and commitment of the SCC board of directors and its operations leadership. Efforts to create a diverse workforce began a full year before a shovel hit the ground — more than two years before the pandemic.

At its peak, the SCC project employed more than 1,200 employees each day and achieved overall workforce participation of 21.4% apprentices (34.7% of which were minorities and 11.7% were women). Apprentices worked more than 1 million hours on the Summit building.

Overall, the project's workforce included nearly 32% minority employees, while nearly 30% of the workforce lived in Priority Hire zip codes, which are economically distressed areas of the region. The project team's intentional diversity program provided economic and job relief to Seattle's struggling communities and created long-term career paths for individuals through education and skill-building.

## HOW DID THIS PROGRAM WORK?

The project team's outreach program focused on two key areas: minority- and women-owned business participation; and workforce participation of minorities, women and apprentices. The project's contracting structure required subcontracted work to be awarded to the lowest bidder. This made selecting minority- and women-owned business enterprises more challenging due to the size and scale of bid packages on a project of this magnitude. To increase small and diverse business participation, the project awarded more than \$150 million to MWBE

businesses compared to a goal of \$80 million.

Building and implementing a diversity program that spurs meaningful change required full team commitment. Workforce diversity goals were set, and a program was developed to accomplish them.

Before construction, the team spent nearly a year working with union affiliates, advocacy groups (Ethnic Chamber Coalition, Tabor 100) and trade organizations (NAMC, The Black Collective, NAWIC) to inform the community about upcoming economic opportunities. Clark/Lewis subcontractors were also encouraged to hire diverse people.

The team recognized that a major challenge with diversity in the industry starts with a lack of awareness about opportunities for Black, Indigenous, people of color and women, as well as available job training. Clark/Lewis formed partnerships with organizations like ANEW, PACE, Youthbuild, and others to connect at-risk individuals with training and opportunities. ANEW's and PACE's pre-apprenticeship programs provide training and career connections for people interested in joining the architecture/engineering/construction fields. Many of the individuals ANEW and PACE serve are BIPOC, women, or were previously incarcerated.

Similarly, Clark/Lewis partnered with What's Next Washington, an organization that helps formerly incarcerated people find careers and achieve long-term economic stability, to support the collection and analysis of on-the-job performance data of workers with conviction histories, helping to remove barriers to success in our industry.

Clark/Lewis tracked the program closely, monitoring each trade and subcontractor to understand strategies that were working and where it was necessary to double down on diversity outreach efforts. Tracking data was shared with other businesses in the industry to help more organizations adopt similar programs.

## WHAT DOES THIS MEAN FOR THE COMMUNITY?

Clark/Lewis placed a high priority on hiring from priority zip codes or areas in the community with higher levels of unemployment or financial need. The Priority Hire program focused on participation from minorities and women at the apprenticeship level, which allowed a traditionally underserved population to use the knowledge learned at the project to build a career in construction.

"Clark/Lewis has been very intentional about this program from the start," said Megan Clark, strategic partnerships specialist at ANEW. "They worked for months to sponsor a cohort to join the crews at the Convention Center. The goal was also to get subcontractors involved to help meet numbers and ensure people stay with those companies long-term. Someone could graduate from ANEW, start at the SCC and work enough hours to journey



A concrete crew completes a pour at the Summit building.

Photo courtesy of Lease Crutcher Lewis



Over 20% of the workforce at Summit consisted of apprentices.

Photo by Tim Rice

out. It is great on-the-job training and helps women and minorities build careers."

## WHY IS THIS PROGRAM SUCCESSFUL?

At the Summit project, the importance of a diverse workforce was driven by support from

the Convention Center, Pine Street Group, the city of Seattle, King County, and the Seattle Building Trades.

While supporting and hiring minority- and women-owned firms is essential to the industry, enacting meaningful, lasting change requires focusing on both business owners and the "boots on the ground" — the craft workers. This combined approach strengthens communities and

builds lasting careers and a future workforce. By assembling a program that also focuses on the workforce, the project created careers for a larger group of construction workers.

"The scale and magnitude of the SCC addition project presented Clark/Lewis with a unique opportunity to develop a program that was the most impactful in terms of tangible growth for the community and local econo-

my," said Viki Bamba Chennault, director of public affairs at Clark Construction. "Clark/Lewis was proud and honored to work alongside local, diverse businesses and residents in building the Summit building and their respective resumes and portfolios as a result of working on the project."

The Summit building created

See REIMAGINING — page

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# Reimagining

*Continued from page 4*

more than 6,000 construction jobs. Equally as important, the project's diversity and inclusion program provided economic stimulus and job relief to Seattle's most challenged communities when living-wage jobs were hard to find.

The hope for this workforce diversity program, and other programs like it, is to develop a long-term tool to help women and BIPOC individuals join — and more importantly, build a career in — the construction industry.

*Brett Earnest, a division president at Clark Construction, leads the development and delivery of noteworthy projects across the Pacific Northwest, including the Sea-Tac International Arrivals Facility and the Seattle Convention Center Summit addition. Gary Smith, executive vice president at Lease Crutcher Lewis, focuses on mentorship, education and successful implementation of alternative contracting methods on commercial and industrial projects.*