

PRO SUCCESS STORY: The Ayer

Project Name: The Ayer
Project Owner: Holland Partner Group
Architect: Weber Thompson
Structural Engineer: CKC Structural Engineers
Prime Contractor: Holland Construction
Concrete Contractor: Conco



Describe any productivity or constructability challenges faced by the design team, contractors, and project owners.

The structural design and construction team was challenged to develop a system that facilitated an open and spacious building layout while simultaneously ensuring structural integrity. The developer was interested in eliminating all obstructions to views of the mountains, water, and city, which required locating key columns inboard from the building's perimeter. The team responded by creating a structural design with just 16 total columns and using perimeter slab cantilevers to optimize efficiency. In addition, column locations were carefully chosen for compatibility with all floor levels—parking, lobby, retail, and residential—which eliminated the need for transfer beams. All columns are continuous from the foundation to the roof, which is unusual for high-rise towers and resulted in an efficient, constructable, and cost-effective structure.

The efficient use of high-strength concrete allowed the design and construction team to contribute further to the request for large, open spaces. Column concrete was specified at 15,000 psi for lower levels, decreasing to 8,000 psi near the top, allowing the use of modest column sizes throughout the building and freeing up living space.

Describe how early-stage collaboration impacted the design process. What are the benefits of establishing a collaborative relationship between all parties involved in the design and construction of projects.

Early collaboration between the entire project team was critical to The Ayer's success. Close discussions between key design and construction team members allowed constructability to guide design decisions from the outset. This ensured that design of the structural system aligned with construction means and methods, ultimately improving efficiency, cost control, and schedule certainty.

Describe how improvements to constructability and productivity were implemented.

The Ayer embodied constructable design principles throughout to maximize structural efficiency and improve field productivity. Constructability thinking was a mindset that complemented every decision, from the conceptual layout to the frame construction. Early meetings focused on subterranean construction, the mat foundation, and sequencing of basement walls. Later discussions helped streamline the detailing of core reinforcement to ensure compatibility with the self-climbing core wall formwork.

The strategic use of concrete strengths up to 15,000 psi in lower-level columns and Grade 80 reinforcing bar in most elements improved structural efficiency and accelerated construction by allowing the standardization of column sizes and core wall thicknesses for the full building height.

A unique core wall coupling beam feature was the use of steel fiber reinforced concrete (SFRC) in lieu of the heavily congested diagonally reinforced beams commonly used in high seismic regions. SFRC reduced The Ayer's cost, accelerated construction, and was well received by the contractor and owner.

Another key constructability focus was to eliminate the "puddling" of column concrete in slabs. Puddling is challenging to properly execute, especially with high-strength mixtures such as the 15,000 psi concrete used in The Ayer's lower-level columns. To properly execute puddling, column concrete must be well integrated with slab concrete, which is difficult to achieve unless the timing of both pours is carefully and consistently controlled. Any delays can cause slab cold joints, with the potential for loss of structural integrity.

For The Ayer, a unique strategy was implemented. Prior to placing slab concrete, wire mesh was wrapped around column cages through the slab depth to prevent slab concrete from flowing into column cores. Column pours followed, with the slab blockouts allowing column concrete to fill the voids. This resulted in continuous high-strength column concrete, uninterrupted by slabs. To ensure the adequate transfer of slab loads to columns, the slab/column connections were supplemented with shear-friction reinforcing bar.

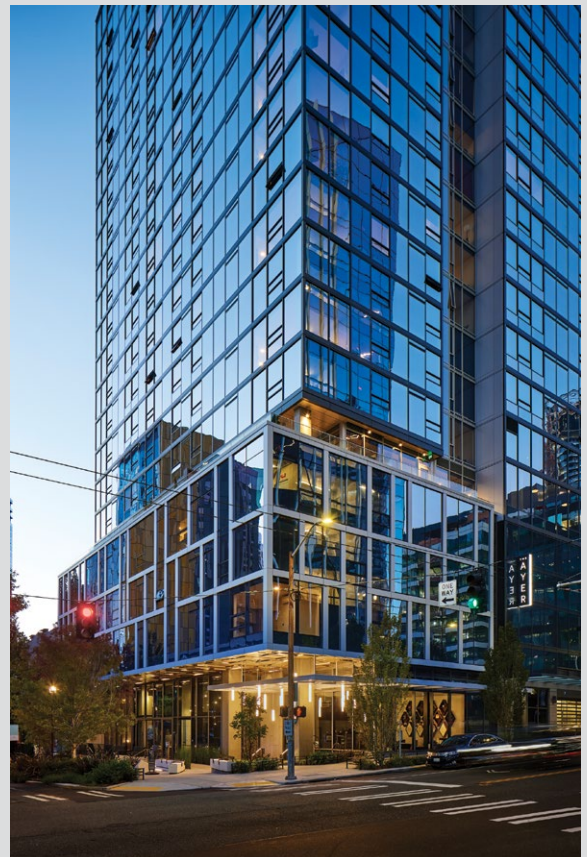
What innovative outcomes in constructability and productivity arose as a result of collaboration?

Close collaboration between key design and construction team members resulted in a building layout requiring only 16 columns, all of which are vertically aligned from the foundation to roof. This eliminated all transfer beams, making The Ayer unique in the world of high-rise towers, for which transfer beams are typically required.

Another innovative outcome was the use of SFRC in coupling beams, replacing heavily congested traditional



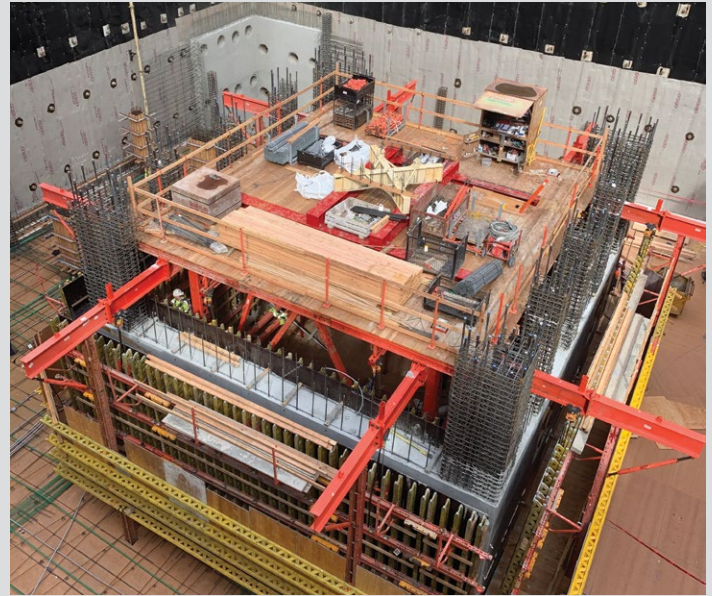
The Ayer is an iconic addition to downtown Seattle and used sustainability-enhancing Type 1L Portland Cement throughout, significantly lowering the building's embodied carbon footprint.



The sleek and geometrically blocked façade of The Ayer was inspired by the tectonics of the Pacific Northwest.



Mat foundation pour six levels below street; The Ayer included six levels of subterranean parking and three levels of parking above grade.



Foundation construction incorporated A706 Grade 80 reinforcing to reduce congestion and tonnage, as did shear walls, columns, and slabs.



Slabs were post-tensioned and used perimeter cantilevers to improve efficiency.

reinforcement. This significantly reduced labor, improved constructability, and accelerated installation while maintaining seismic performance.

Lastly, the solution developed to eliminate slab “puddling” allowed uninterrupted high-strength column pours and improved quality control and construction speed.

How does the constructability of this design positively benefit the project owner?

For the owner, the constructable design translated into reduced construction risk, improved schedule reliability, lower cost, and enhanced long-term value. For example, eliminating transfer beams and simplifying structural systems reduced complexity, while efficient material use and sustainability measures lowered embodied carbon. The result is a high-performing building delivered with greater long-term durability, faster construction speed, and reduced construction cost.

How does the constructability of this design positively benefit the contractor?

The contractor benefited from clear sequencing, simplified detailing, and reduced reinforcing bar congestion. Standardized column sizes and wall thicknesses, efficient core construction, and the



The Ayer's rooftop features floor-to-ceiling glazing and an expansive terrace, blending indoor comfort with sweeping skyline views.



The main entrance features a sleek glass-and-steel façade, enhanced by lush landscaping and welcoming walkways.

elimination of difficult-to-build components minimized rework and accelerated construction cycles. Constructability-driven decisions allowed crews to work more efficiently and predictably, improving overall productivity and jobsite safety.

How does the constructability of this design positively benefit the design team?

From a design perspective, early collaboration and constructability-focused decision-making allowed the team to optimize structural performance while maintaining design intent. The integration of performance-based design, material efficiency, and buildable detailing reduced downstream coordination issues, created teamwork, and facilitated a shared understanding between design and construction. The result was a streamlined process that elevated both technical performance and project delivery.

Comment from Project Stakeholder Scott Meyers, Vice President PNW Estimating & Preconstruction:

As a result of the early coordination between design and construction team members, the Issued for Construction set of structural drawings was released well in advance of starting the mat foundation, saving time and money by reducing questions, mistakes, delays, and change orders.



Collaboration throughout design and construction enabled the full potential of modern building systems to be realized, enhancing quality, controlling the budget, and accelerating the schedule.