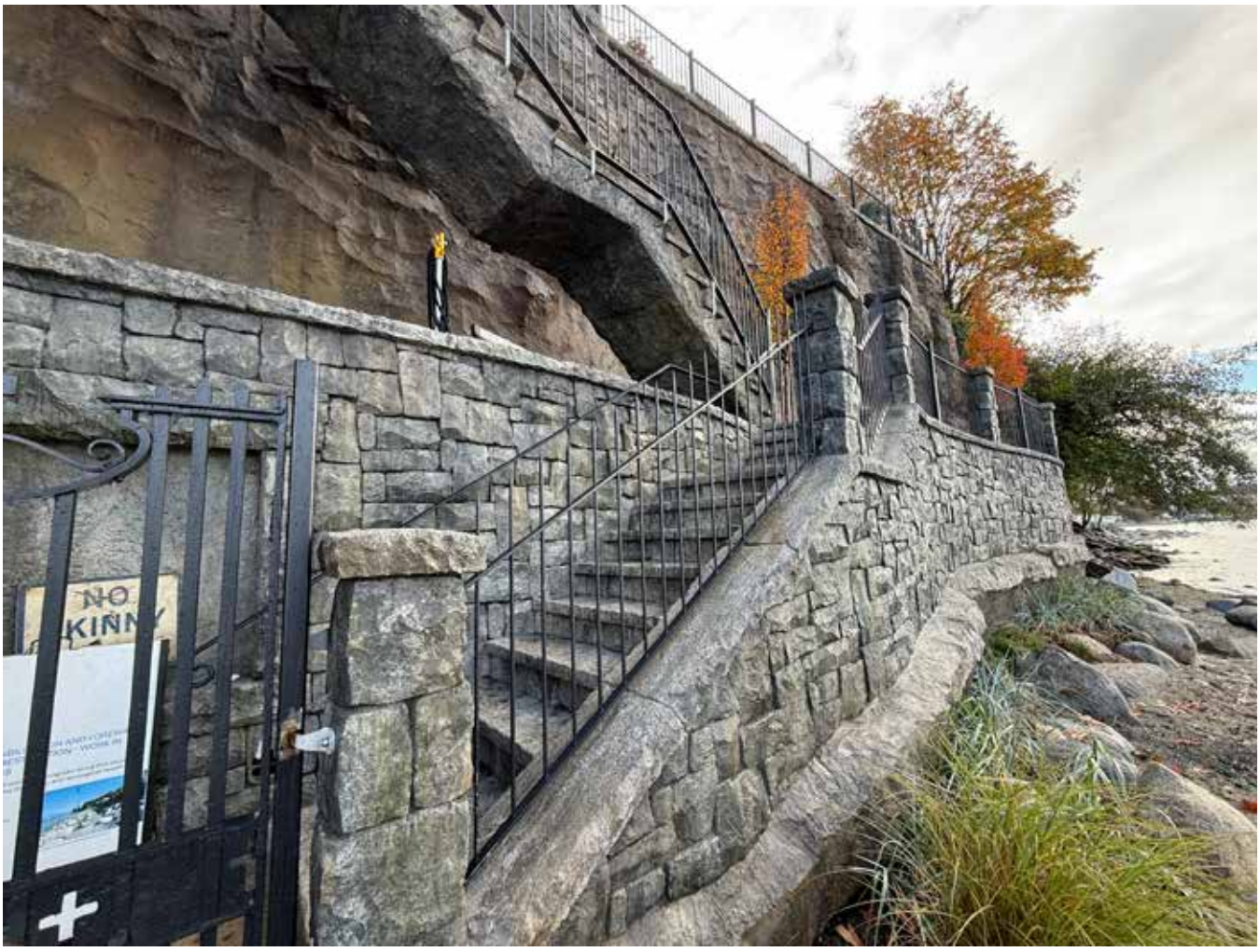


Lower retaining wall placed with shotcrete, followed by hand-sculpted dimensional stone detailing to integrate structural performance with natural aesthetics

Point Grey Foreshore

COASTAL STABILIZATION THROUGH SHOTCRETE INNOVATION

By Dan Pitts

Perched high above the Pacific, the Point Grey Foreshore stabilization project presented a rare convergence of coastal engineering, structural complexity, and architectural artistry. Rising approximately 45 ft (14 m) above sea level, the site demanded a solution capable of withstanding marine exposure, challenging access, and complex geometry, while also delivering a finished surface that blended seamlessly with its dramatic surroundings. Shotcrete proved to be the ideal answer.

Completed by Ocean Rock Art Ltd, the project showcases how advanced shotcrete techniques can merge structural performance with sculpted architectural expression, resulting in a stabilization system that is both resilient and visually compelling.

ENGINEERING AGAINST THE TIDE

One of the defining challenges of the project was the tidal environment. Structural shotcrete placement had to be carefully coordinated with tide cycles to ensure optimal conditions for bonding, curing, and long-term durability. Crews timed their operations precisely, shooting the structural elements during favorable tidal windows to minimize exposure to wave action and water intrusion.

This approach allowed Ocean Rock Art to create a

monolithic, reinforced structural concrete shell that tied directly into the hillside while resisting the dynamic forces of the coastal setting. Shotcrete placement's ability to be applied vertically and overhead — without traditional formwork — was critical in maintaining efficiency and safety in such a demanding environment.

PUMPING DISTANCE AND SITE ACCESS

With limited access at the top of the bluff, material delivery posed another significant hurdle. Shotcrete was pumped approximately 275 ft (84 m) from the staging area to the point of placement. This distance highlighted one of shotcrete's most valuable advantages: Its ability to maintain consistency, workability, and structural integrity over long pump runs without segregation or performance loss.

The pumping setup minimized site disruption, eliminated the need for heavy lifting equipment, and allowed continuous placement in an otherwise difficult-to-reach coastal location.

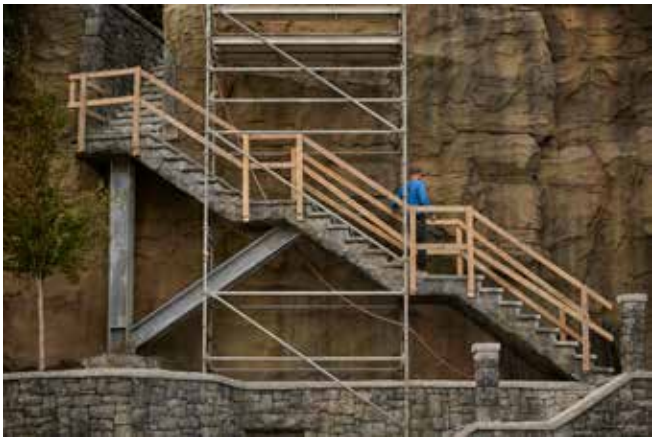
CURVED GEOMETRY AND STRUCTURAL FREEDOM

The project's sweeping curved retaining wall is both a structural necessity and a defining architectural feature. Traditional form-and-pour concrete would have required extensive, highly customized formwork to achieve the radius and integrated details. Shotcrete placement removed those constraints entirely.

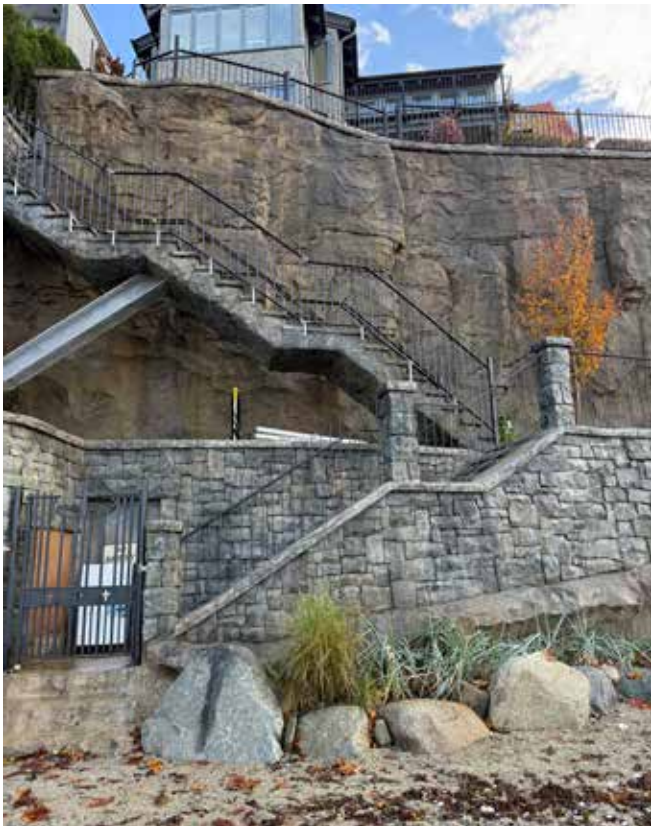
By applying material directly to the reinforcing steel, Ocean Rock Art shaped the wall organically to follow the site's natural contours. This formwork-free approach allowed for continuous curvature, uniform structural thickness, and seamless transitions, demonstrating why shotcrete placement is especially well-suited for complex geometries.

DECORATIVE SHOTCRETE AND ACCELERATED SCULPTING

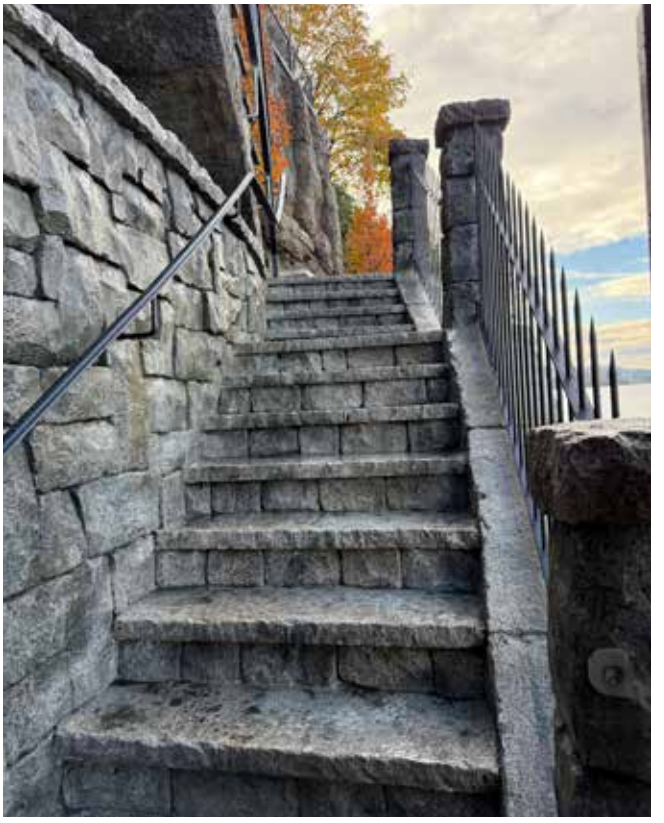
Following structural placement, the project transitioned into its architectural phase. Decorative carve-grade concrete was applied using an accelerator atomizer at the shotcrete nozzle, enabling rapid set times below the tide line and immediate sculpting. This technique was especially



Custom sandstone-style shotcrete sculpture carved to replicate natural stone formations while maintaining engineered durability



Floating stair system constructed in shotcrete and finished with sandstone textures, creating a seamless transition between structure and landscape

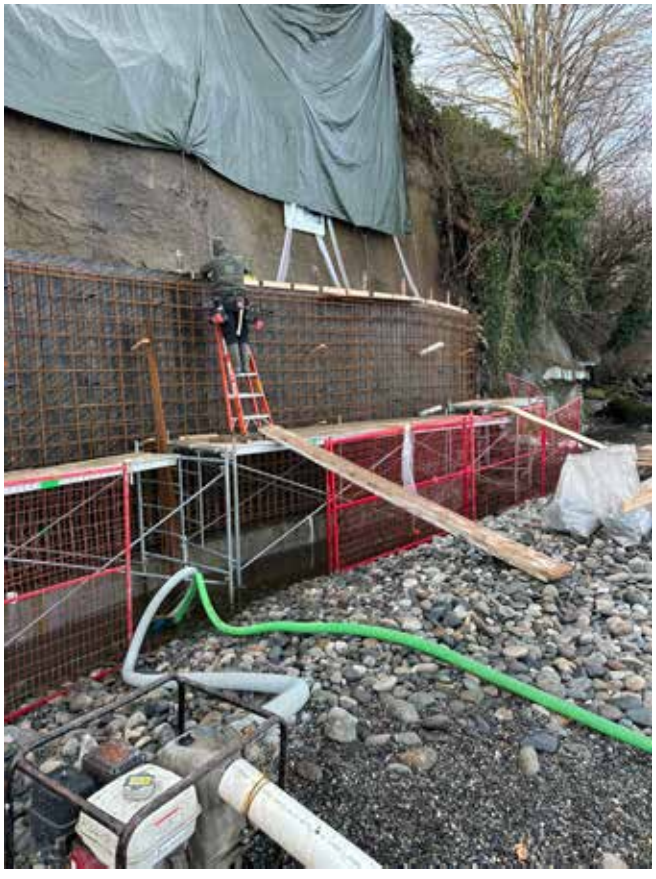


Completed shotcrete stairs and columns demonstrating consistent texture, form accuracy, and structural integration

important for overhead surfaces, where traditional finishing methods would have been impractical.

The lower portion of the wall was shot monolithically and then sculpted to evoke an old English castle-inspired, dimensional rock placement, including a curved turret that adds depth and character. The upper wall section was sculpted to mimic a west coast sandstone cliff. All stairs, risers, and treads were sculpted entirely from concrete, integrating structural durability with hand-carved detail.

Multi-stage coloring process applied to shotcrete surfaces to achieve realistic stone tones and depth



Steel reinforcement and formwork in place prior to shotcrete placement, ensuring structural integrity and long-term performance

FLOATING STAIRCASE AND OVERHEAD APPLICATION

A signature element of the project is the floating staircase, which was formed and poured and then sculpted once stripped. Shotcrete placement's exceptional overhead adhesion, accompanied with the use of accelerator atomizer, allowed full reinforcement encapsulation and fast sculpting while eliminating the need for complex underside form liners.

Once placed, the staircase was carved to resemble naturally weathered, west coast-manufactured granite block with layered color textures, softened edges, and organic variation that reflect the coastal geology of the region.

THE WEST COAST SANDSTONE FINISH

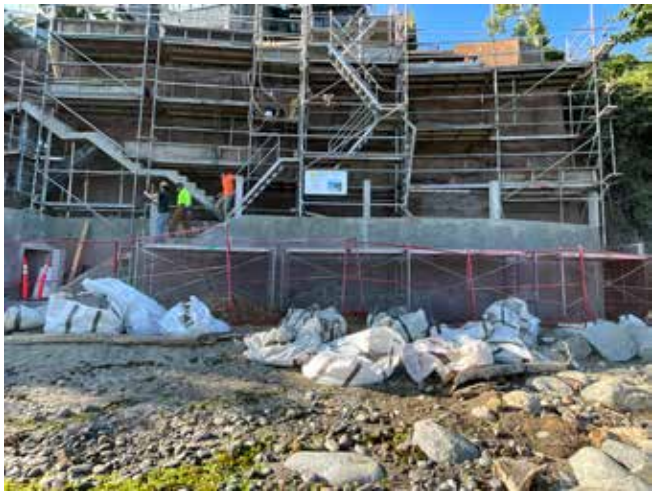
Throughout the project, the larger finished shotcrete surfaces were sculpted to replicate the look of west coast sandstone, rather than traditional masonry or quarried stone. This aesthetic choice grounds the structure in its natural environment, allowing the stabilization wall, landings, and architectural elements to appear as if shaped by the coastline itself.

The result is a cohesive visual language — rugged, timeless, and unmistakably coastal — achieved entirely through sculpted shotcrete.

A LASTING COASTAL STATEMENT

The completed stabilization wall stands as both an engineered solution and a sculpted architectural feature. Through precise timing, technical expertise, and artistic craftsmanship, Ocean Rock Art delivered a project that stabilizes the coastline while enhancing its visual presence.

By harnessing the full potential of shotcrete placement, the Point Grey Foreshore stabilization demonstrates how modern concrete techniques can protect, shape, and elevate coastal environments, creating structures that are as enduring as they are expressive.

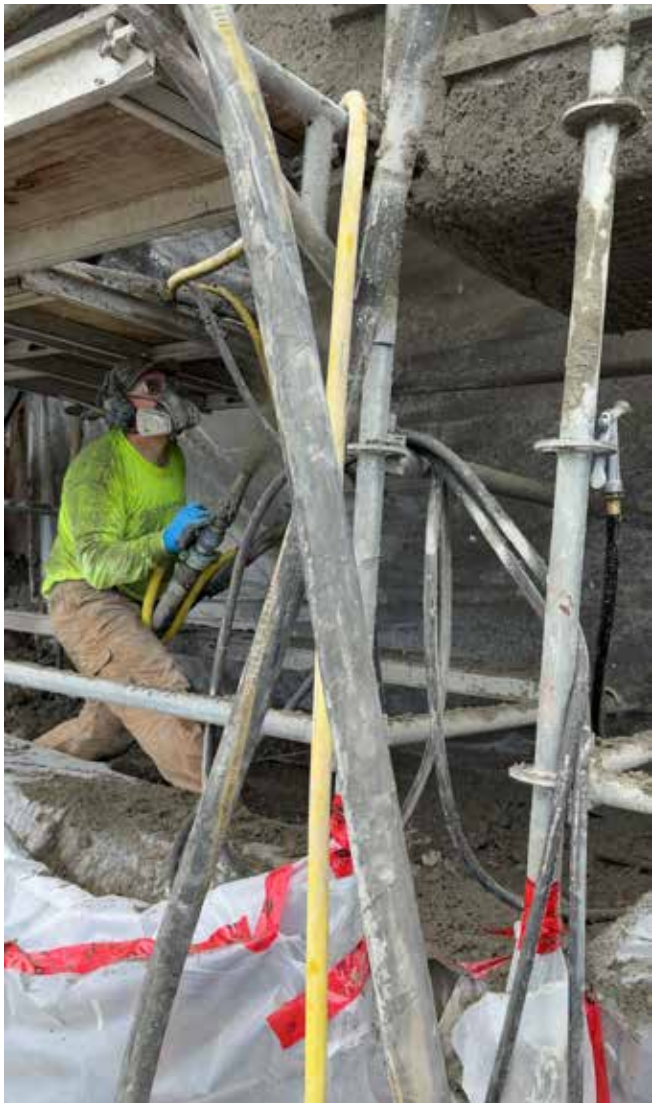


Engineered scaffolding system installed to provide safe access for shotcrete application and sculpting in a challenging shoreline environment

Why Shotcrete Was the Right Choice

Shotcrete provided critical advantages for the Point Grey Foreshore project:

- Formwork-free construction for complex curves and vertical surfaces
- High bond strength, ideal for coastal stabilization
- Reliable pumping over long distances of approximately 275 ft
- Accelerated set times enabling immediate carving and detailing
- Seamless integration of structural and decorative concrete



Overhead shotcrete application beneath stair structure, showcasing precision placement in confined and elevated conditions

2025 OUTSTANDING NEW CONSTRUCTION PROJECT

Project:
Point Grey Shoreline Stability

Project Location:
Vancouver, BC, Canada

Shotcrete Contractor Company:
Ocean Rock Art LTD*

Architect Company:
Paul Sangha Creative

Materials Supplier Company:
Heidelburg Materials

Equipment Manufacturer Company:
Putzmeister*

General Contractor
GWilson Construction

Owner:
Claire and Jaime Wright

**ASA Sustaining Corporate or Corporate Member*

***Dan Pitts** is President of Ocean Rock Art Ltd. and Partner in Ocean Rock Art US LLC. He is an ACI Certified shotcreter and proudly serves as a sustaining corporate member of the American Shotcrete Association. Ocean Rock Art's work has garnered widespread recognition, earning multiple accolades. Dan Pitts's innovative approach to blending nature with design sets him apart as a true luminary in the field of shotcrete rock art, leaving an enduring mark on the landscape of contemporary architecture.*