

# Deep Cove Foreshore Development

By Dan Pitts



of someone to do the rock sculpting portion of the project. This news was a bit of a letdown but we thought maybe we could change their minds. When we initially arrived on site, I could see many logistical challenges, for not only us but for the potential rock sculpting crew the owner had in mind for the project. After waiting a few minutes for the owner to show up, around the corner comes Andre (Andre is a client we recently did a rockwork job for in Whistler, BC). Not sure what to think and why he was here, we started to chat. Only then did we realize he was the owner of the newly purchased property, and we were the rock guys he had in mind to do the project! Now this was cool! But of course now we had to figure out how to get all the rock work done.

### SITE ISSUES

Site logistics were tight. The recently built home was full of settlement cracks and a total drop of 1.5 in. (38 mm) in the northwest corner. This prompted the geotechnical engineer to conduct some exploration work. The soil investigation found there were voids in the subgrade due to poorly placed structural fill from the original construction of a marina 30 years ago that had long been removed. The client hired Capilano Builders to be the general contractor for the project which included an almost full gutting of the only 10-year-old home.

This home sits perched up about 60 ft (18 m) from the beautiful Deep Cove. The ocean boasts plenty of sea life and our number one priority was to protect the sea life with an environmental protection plan established by the North Vancouver district and Capilano Builders. To stabilize the house and soils the house was built on required approximately 40 to 50 ft (15 m) anchors installed by Braestone to bear on the bed rock beneath the home. This work

**W**e got a call from one of the local drilling contractors, Braestone Rockworks to check out a shotcrete shoring project down at Deep Cove in North Vancouver, British Columbia. After further discussion over the phone with Braestone, we were told the client and landscape architect already had tentatively thought

required a custom site-specific drill rig. The ocean was protected by close monitoring and a floating tarp system. The tight driveway and private gated road presented further challenges. Keeping access for a fire lane and allowing the flow of cars to access the marina while ready-mix concrete trucks were unloading meant we didn't have any staging



areas for the waiting ready-mix trucks, so timing was everything. Luckily there was an area for the ready-mix to turn around at the marina since it is private, and a gate prevented public entry.

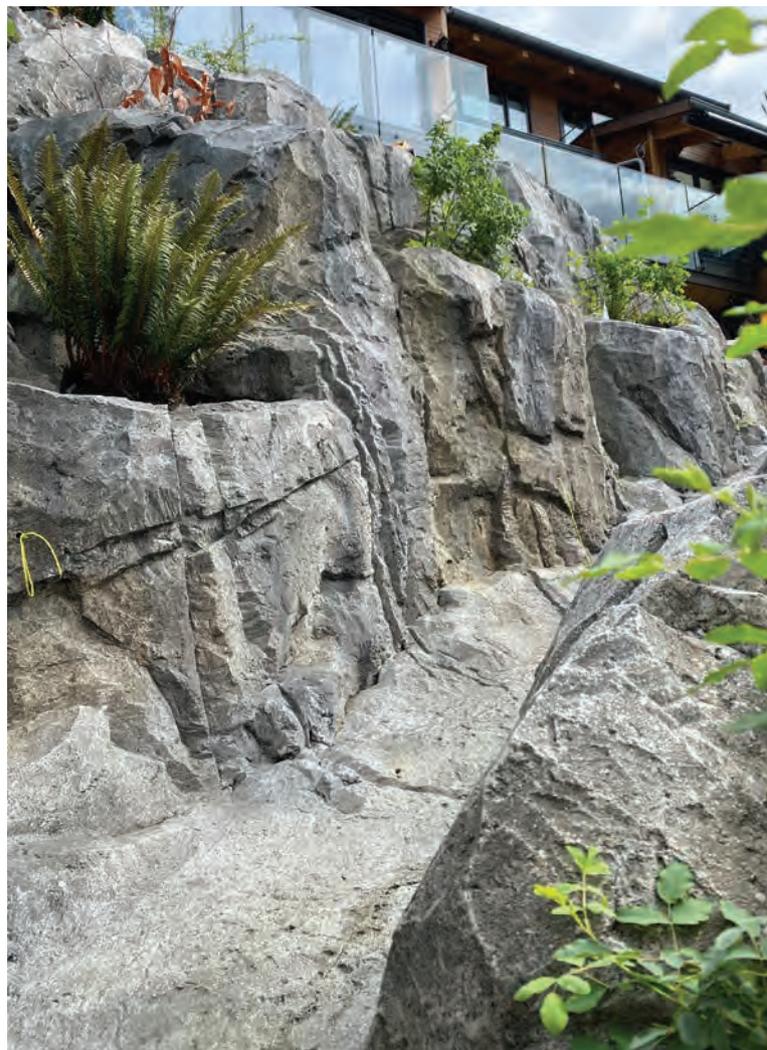
Once we finished the initial shoring application, we were on our way to making the shored property visually appealing and functional with our rockwork to access the water again. Paul Woodbridge, with our ready-mix concrete supplier Rempel Bros. Concrete in North Vancouver, provided much appreciated help in developing corrosion-inhibiting concrete mixture designs to help protect the embedded reinforcing steel from the salt water exposures. One of the main stipulations from the environmental engineer and district staff was we needed a minimum M2 area for planting. This was included in our design, and we ended up not only meeting but exceeding their request. We built planters complete with drainage, irrigation, and lighting with the assistance of Mike at NorVan Lighting and Sprinklers in North Vancouver. The company was very professional and were available whenever we needed them. The property was relatively steep, so we built a custom scaffold system to shoot and sculpt the shotcrete.

## EQUIPMENT

We enlisted one of our Putzmeister pumps for this entire project. Our TK20 with hydraulic detachable mixer was the

game changer on this project allowing us to mix our own carve coat giving us close control of set time by staging the mix. All our concrete for the structural work core of the rock was supplied by Rempel. By mixing our carve coat concrete onsite, we eliminated any concern about truck delivery time.

As the weather in Deep Cove is similar to that of Hawaii we knew to expect rain so we were setting up tarps for either shade protection or rain protection daily. We tweaked our concrete mixture with retarder and supplemental cementitious materials allowing us even more control of set times to push our production rates while allowing us sufficient time to create all the details we are so well known for. With pumping distance on average of 250 ft (76 m) and a stationary pump location we placed a slick line that stayed in place for a majority of the job. Moving and managing delivery hoses was another tricky aspect of the project. With constant movement and special ability of our talented ACI-certified shotcrete nozzlemen, the shapes and movements were done with precision, requiring constant preplanning. The nozzleman was securely tied off much of the time to avoid falling into the guardrails or into the planters. The backup nozzleman and crew played a huge role in assuring the safety of the nozzleman.



## CARVING

Carving a big project like this takes a lot of preplanning with sun, angles, fault lines, colors, viewing points and useability. We were able to incorporate the natural layout of the shoring structure to create multiple pathways, access points and hang-out zones. All these areas needed to be thickened and engineered with armature steel in the early stages of the layout. Making something look natural and having it feel safe to use by the client and guests was another task. All the rock was brought up above the walking path to create a sense of security while walking along the path on the steep hillside. This all needs to be designed for the armature steel during the preplanning. We used the fault lines we created in the carved rock to visually line up with the planters and walking path elements. Some of the carving had to be done during a low tide so special timing of carving and concrete mixing was critical.

## COLOR

After approximately 16 days of carving and added time for curing we were ready to color. The hot sun worked in our favor drying every layer of our 12-step paint process as fast as possible. Moving around a large project like this with so many nooks and crannies and not missing a single square inch becomes a time consuming race.

## COMPLETION

We completed this project that ended up including a new driveway, planters and pathways around the entire house in approximately 8 months. Shotcrete was the essential factor in completion and practically speaking, could not have been done any other way.



**Dan Pitt**, Owner/Operator of Ocean Rock Industries, Squamish, British Columbia, Canada. Ocean Rock Art specializes in artisanal concrete rock environments. Everything we do is custom designed and hand-crafted to ensure the perfect fit for your landscaping or construction project. With years of experience and top notch concrete artists, Ocean Rock is ready to build the rock environment of your dreams.

## 2021 OUTSTANDING INFRASTRUCTURE PROJECT

*Project Name:*  
**Deep Cove Foreshore Development**

*Location*  
**North Vancouver, BC Canada**

*Shotcrete Contractor*  
**Ocean Rock Art Ltd.**

*Architect/Engineer*  
**Kontur Geotechnical**

*Material Supplier*  
**Remple Bros Ready Mix**

*Equipment Manufacturer*  
**Putzmeister**

*General Contractor*  
**Capilano Builders**

*Project Owner*  
**Andre & Trudel Kroecher**

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