

Article from The Weehawken Reporter.Com



## Preserving Kings' Bluff

Geologists, engineers work to maintain rock face of Palisades in time for Light Rail

By Jim Hague

Reporter staff writer January 31, 2003

Inquiring minds had to be curious when they traveled along the Weehawken waterfront about the guys who looked like Bavarian mountain climbers scaling their way up and down the Palisades.

The temperatures were in the teens, the wind chill in negative numbers, and they were making like Sir Edmund Hillary. It's a scene certainly not regularly witnessed in Weehawken.

There had to be a method to the obvious madness, no?

In fact, there was. These rock climbers are not doing it for the sport, but have a very important role to fill. They are busy securing the rock face of the Palisades, better known as Kings' Bluff, so that the construction of the NJ Transit Hudson-Bergen Light Rail can continue below the rocks.

The geologists and engineers involved in the six-month project will not only preserve the beauty of the ancient rock structure, but will prevent any possible rockslides for many years, as the Light Rail will regularly travel the route below.

The project, which is being done jointly by renowned contracting firm Janod Contractors of Swanton, Vt. and the worldwide geologist experts Golder Associates, began Jan. 3 and will continue until every ounce of the rock on the Palisades is examined and secured.

Would have happened anyway?

According to Weehawken Public Safety Director Jeff Welz, there was a need to secure the rock structure long before the Light Rail ever thought about coming through Weehawken.

About 10 years ago, a boulder from Kings' Bluff was dislodged, rolled toward Port Imperial Boulevard and demolished a vehicle. Luckily, no one was injured, but it was enough to cause concerns, especially if a mass transportation system was scheduled to operate directly below the rocks.

"Fairly large portions of the cliff have fallen down over the years," Welz said. "Time and weather were the worst enemies of the cliff face. When the Light Rail decided to come in, they knew they had to have some sort of safety precautions put in place there."

According to Weehawken Mayor Richard Turner, the initial proposal was to put a fishnet screen around the face of the rocks, as well as putting a lot of concrete around the facing to secure the protective screen.

"The wire mesh, filled in with concrete, was simply not acceptable to us," Turner said. "This is a majestic area, where the Palisades ends. We wanted to keep it in its natural state as best as possible."

21st Century Rail, which is constructing the entire Hudson-Bergen Light Rail system for NJ Transit, then began to look at companies that specialize in preserving rock structures, while also securing and stabilizing them.

"We were impressed with both Janod and Golder, both who had a lot of experience in fixing rock structures," said Michele Butchko, the director of community relations for 21st Century Rail. "We knew that this was not business as usual."

Janod and Golder have done numerous projects across the country, including Yosemite Park in California, Niagara Falls, Glacier National Park, the Cumberland Gap and the Natural Bridge in Virginia. In fact, Golder has offices all over the world, working on similar projects.

NJ TRANSIT had already done initial surveys to determine what kind of stabilization was needed at the site.

"A lot depends on the rock and the rock face," said Daniel Journeaux, the president of Janod Contractors. "It depends on the jointing, the cracks in the rock, the structure, the weather, freezing and thawing. It all leads to de-stabilization. We had practical experience, what can and cannot be done. Golder finds what method we can use."

Every square inch of the rock face was mapped out and reviewed: thus, the rock climbers who rappel up and down the rock face. They are experts examining every single rock, every inch of Kings' Bluff, to see what rocks are secure, what rocks need to be secured and what rocks have to be removed.

Journeaux said that it would have been easy to just hire a crane and have someone operate out of a cherry picker and examine the rocks.

"But the crane would have disrupted traffic down there and there's a lot of vehicular traffic there," Journeaux said.

He added, "When you're hanging off the ropes, you have the best equipment possible and you don't have to rely on a crane operating everything for you. We have the experience to understand what is safe and what is not safe."

The Janod representatives are the ones who man the ropes, meticulously checking each piece of rock, inserting a "scaling bar," a four-foot metal pole, into the rock to stabilize it. The only rocks that are removed are the ones that are loose and considered dangerous.

"We look at the rock that might come down," said Peter Ingraham, the geological engineer for Golder. "None of us have a crystal ball that can tell us when the rock will come down, but there is a lot of risk there, especially with increased pedestrian and train traffic coming to the area."

According to the chief geologist on the project, Dr. Ramesh Venkatakrishnan, Kings' Bluff is "a geologic classic."

"Geologists get geological references from Kings' Bluff," Venkatakrishnan said. "There are two types of rock there, a sedimentary rock, which is sandstone and siltstone, and an igneous rock, which is called diabase. The rock is probably 190 to 200 million years old. The bluff itself was carved perhaps 10,000 or 15,000 years ago. It's a wonderful structure."

After scaling the rocks and determining which needed stabilization, the contractors inserted small rock bolts into the bluff, combined with a mixture of shotcrete. There is also a method of coloring the shotcrete that blends into the rock and makes the bolts unnoticeable. The contractors call the process "dental work."

"It is like filling a cavity and stopping the natural decay," Journeaux said.

The scaling portion of the project and the removal of the loose rock have already been completed. Workers were busy last week drilling holes into the rock to act as a natural drainage, in order to keep water collecting behind the rocks and loosening other rocks that hadn't been secured.

The remainder of the project will take six months to complete. However, residents will continue to see workers climbing up and down the Palisades throughout that time.

Right now, a protective netting has been put in place to catch any possible falling rock. That eventually will be removed.

"The biggest challenge has been maintaining the beauty of the Palisades, without any visual impact," Journeaux said. "It's going to look like it did before we ever started working."

Journeaux said that his group has been so impressed to be working with the Manhattan skyline as a backdrop.

"We've been all over the world and we've never had anything like this," Journeaux said. "You have to stop and shake yourself to see if it's real."

And how about the weather conditions?

"We've worked in all kinds of conditions before," Journeaux said. "Some of us are from Canada. We actually worked on a gold mine in northern Quebec that we had to dynamite the ice off the mine. It was 30 below zero. So this is summertime to us."

Charles Ingoglia, the director of public affairs for NJ Transit, is pleased with the way the project is going.

"We knew that there were going to be challenges here and knew it had to be as safe as possible," Ingoglia said. "We're clearing away any obstacle to provide a safe area, both for the community and for the Light Rail."

"It's an outstanding way to preserve the cliff face," Turner said. "They're restoring the cliff like they do in national parks. We wanted to keep the cliff in its natural state and that's what's happening."

The Hudson-Bergen Light Rail is scheduled to be ready for operations in Weehawken by late 2005. Both Butchko and Ingoglia said that the rock preservation project should have no effect on the Light Rail construction.

©The Weehawken Reporter 2003