



NEW SLATE ROOFING SHINGLES WERE INSTALLED ON THE WINDMILL AND COTTAGE.



# San Francisco Giant

## *Majestic Murphy's Windmill Gets a New Lease on Life in Golden Gate Park*

by Marc Dodson, editor, with historical information from Sarah LeVaun Graulty, University of Vermont Historic Preservation Program

**W**ind power is nothing new. Man has been harnessing the power of the wind for centuries. But in 1887, it seemed like a radical idea when John MacLaren became Supervisor of Golden Gate Park and, along with Park Commissioners Adolph Spreckles and Reuben Lloyd, advocated strongly for the use of windmills to pump fresh water into the park. Fresh water was always a rare commodity in the growing West. Mark Twain once said that, "Whiskey is for drinking. Water is for fighting over."

In 1902, after a great deal of discussion, MacLaren finally succeeded in persuading the Park Commission to order the construction of a North, or "Dutch" windmill in the northwest corner of the park at a cost not to exceed \$14,000. Prior to the Dutch Windmill's construction, sprinkling wagons, hired from Spring Valley Water Company at \$1,050 a month, brought in water to irrigate 70 acres of park. The new windmill supplied the first pumped water into Golden Gate Park and was able to irrigate 100

acres of land at an entire cost of just over \$18,000.

Samuel G. Murphy, a San Francisco banker and philanthropist, was inspired to donate \$20,000 for the construction of a second windmill in order to make Golden Gate Park, "the most beautiful spot in the world." And so begins the saga of Murphy's Windmill.

J. Charles Henry Stut, a German born, Oakland-based mechanical engineer, prepared plans and specifications for the new windmill, which were approved in August 1905. Construction began immediately, but the massive earthquake that shook the city on April 18, 1906, substantially delayed completion of the mill. The windmill was finally completed in 1907 with the adjacent millwright's cottage constructed a few years later. The structure was approximately 97'-tall, including an octagonal 30' concrete base and a 15' copper clad dome atop the tower, and pumped 40,000 gallons of water per hour, pumping the fresh water from 200 feet below the surface.

Both the Murphy and Dutch windmills are unlike any others in the world, were built as massive machines to catch the winds and storms that came in off the nearby ocean, just 300' to the West. A system was devised in which the sails turned clockwise, the opposite direction of their Dutch and European counterparts. In addition, all of the machinery was fashioned from steel and cast iron, unlike Dutch windmills, which have historically used wooden gear systems. At 114' each, the Murphy Windmill's sails are the longest in the world. Internationally, these two windmills are known as the "San Francisco Giants."

The windmills fell into a state of disrepair, and in 1966, the Murphy Windmill sails were removed. While the Dutch windmill was later restored and designated a city landmark, the Murphy Windmill would have to wait. Then in June 2000, at a reception presenting plans for a nearby community center pavilion, San Francisco Supervisor Mark Leno

(Continued on Page 22)



THE MILLWRIGHT'S COTTAGE TOOK APPROXIMATELY THREE WEEKS FOR COMPLETION OF THE NEW ROOF.



## San Francisco Giant

(Continued from Page 20)

announced a pledge of \$500,000 on behalf of the City towards the windmills' restoration process. Later, the city would contribute another \$500,000. The movement gained momentum and other public and private fundraising efforts contributed to the cause.

In 2003, the architectural firm of Carey & Co. submitted a Historic Structures Report to the Recreation and Parks Department. The three panels on the windward side of the eight-sided structure were in a critical state, due to the direct exposure to the Pacific Ocean. These panels were characterized by a heavy loss of shingles, extensive dry rot, loss of wood cladding, and biological growth.

The restoration of the Murphy Windmill involved a two-part plan. The scope of the first phase called for removal and restoration of the top part of the windmill. Once both the interior and exterior of the tower were refurbished and back in place, it was on to the second phase. This phase included such items as the cop-

per and slate for the windmill's cap and wall cladding.

Waterproofing Associates, Mountain View, Calif., handled the installation of all the slate on the Murphy Windmill and Millwright Cottage. Waterproofing Associates has been in business since 1992. The general contractor was Roebuck Construction, San Francisco. Consultant on the project was windmill designer Lucas Verbij. Verbij's Netherlands-based family business has been constructing, restoring, and maintaining windmills throughout the world since 1868.

The first portion of the roofing project was the millwright's cottage. Matt Rabong, Waterproofing Associates project manager states, "After demolition of the existing slate (the existing slate was not salvageable) and deck repairs completed by Roebuck Construction, we were to install natural slate roofing shingles over moisture shedding underlayment and ice dam protection membrane." Materials used on the project were:

North Country Natural Slate Shingle Unfading Black, medium texture, ¼" thickness; fasteners, smooth shaft stainless steel nails; underlayment, MBTechnology Layfast SBS fastened with plastic cap fasteners; Grace Ice & Water Shield underlayment; Johns Manville Bestile utility cement; and Sonneborn NP1 caulking. The installation was performed in accordance to the guidelines set forth in the *Slate Roofing-Installation Manual 5th Edition*.

The entire roof was 25 squares with a 12:12 pitch. It took the crew approximately three weeks for completion. The superintendent of the project was George Timmons and the project foreman was Salvador Garcia.

Waterproofing Associates then took on the tower of the Murphy Windmill. Using the same materials, the crew applied slate to the 54 squares of wall cladding. This portion of the project took about four weeks to complete.

Rabong also noted, "In my 18 years with Waterproofing Associates, I have not been asked to bid anything

quite like a windmill. We've performed roofing and waterproofing repairs up at the top of the 285' tall Stanford Hoover Tower, climbed the Historical Hanger 1 in Moffett Field to assist the government with budget numbers for remediation work, and installed the cap and pan clay tile roofing on the historical Carrington Hall Performing Arts Center, but never a windmill. This was definitely a first for the company and for me.

"During bid time, Dennis Ryan, president of Waterproofing Associates, could see my reluctance to bid this job as we sat down to review my numbers. I had already done my homework and had pricing and measurements accounted for, so we looked it over and sent out our bid. We were awarded the project with Roebuck Construction. The management of this project by Roebuck Construction was very well done. The coordination and cooperation of all trades allowed for execution and completion of a very smooth project that was completed on time.

"So what was my reluctance? Well, having been involved with a

few high-profile, high-risk, and challenging projects, I must say I have never installed roofing on the side of a building with a 100' propeller mounted to the top. I didn't know how fast this thing could fly! I sure have a different perspective now. As the project manager, the company webmaster, and photographer, this has been a very fulfilling project for me."

Ryan added, "Our crew did an excellent job. They are very fine craftsmen." George Timmons, the project superintendent and Sal Garcia, the project foreman executed the safety plan and installation of the slate for both the cottage and the windmill with precision. The slate for the windmill had to be hand loaded with a rope and wheel to the scaffolding from the viewing deck. Then each piece was installed with stainless steel nails. The angled hip cuts were mitered at each of the eight vertical hips that extended to the copper cap at the top of the windmill. The Murphy Windmill project was



completed in October of 2011 and now the windmills serve as a centerpiece of the Golden Gate Park.

While the smock sails on these windmills look magnificent, at the present time they are strictly cosmetic. The windmills are not pumping water as they were originally designed to do. The city hopes that in the future the windmill's pumps will irrigate nearby soccer fields, or pump into the Chain of Lakes, which are bodies of water in Golden Gate Park reserved for recreational use.

In the meantime, these refurbished "San Francisco Giants" stand majestically as a link to our past.

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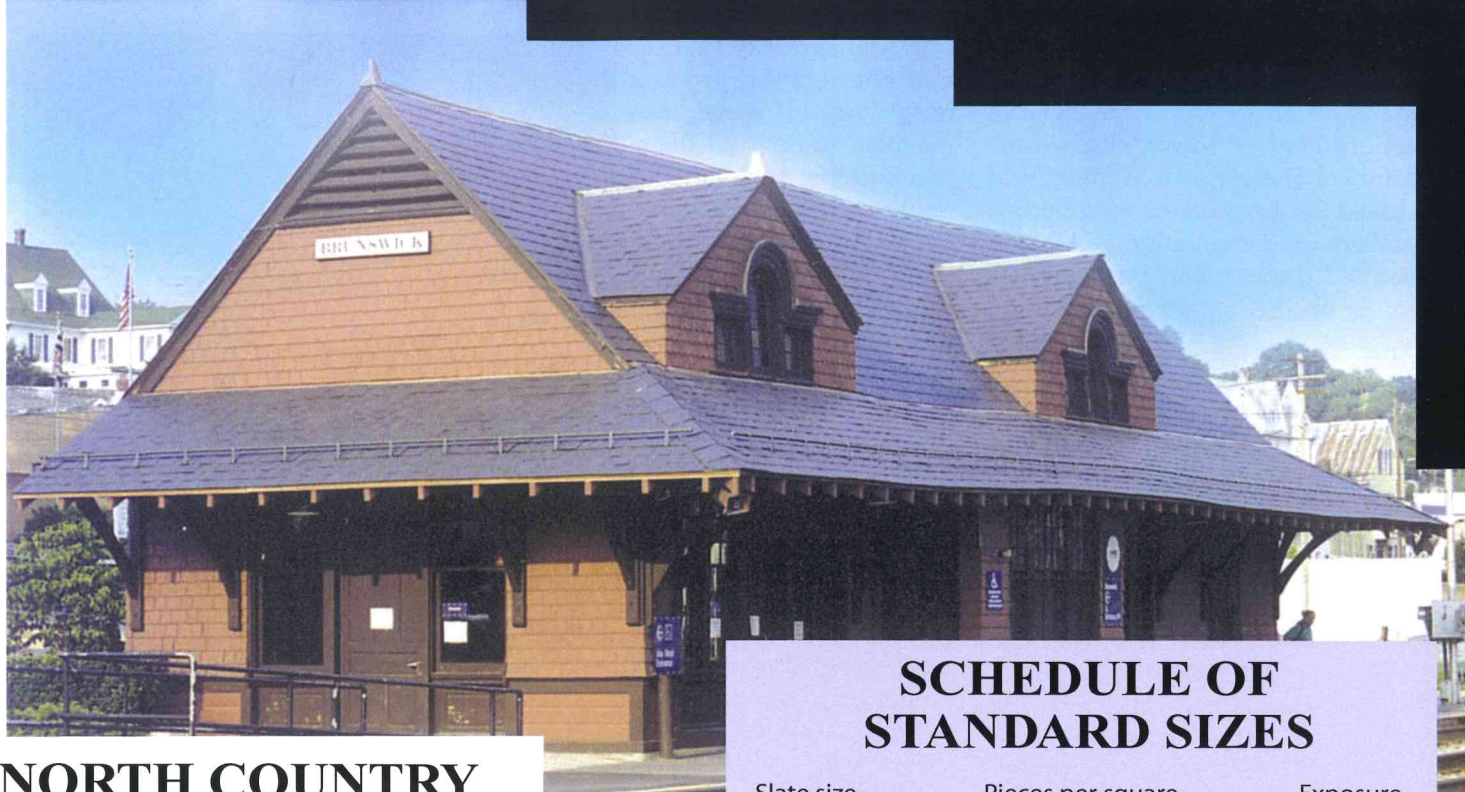
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North Country roofing slate when fixed with non-corroding nails or hooks can provide a service life in excess of 100 years.

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- Resistant to chemical pollutants and acid rain.
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- Unaffected by freeze/thaw cycles.
- Environmentally safe.
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- Proven performance on rooftops.
- Delivered from stock.
- Special trimming on request.

## THICKNESS AND WEIGHT

North Country Slate is available in the following nominal thicknesses:

Standards	3/16"	700 lbs./square
Quarters	1/4"	900 lbs./square
Textured	1/4" - 3/8"	1100 lbs./square
Heavies	3/8"	1400 lbs./square

## SCHEDULE OF STANDARD SIZES

Slate size Inches	Pieces per square at 3" headlap	Exposure at 3" headlap
24x12	115	10.5"
22x12	126	9.5"
22x11	137	"
20x12	141	8.5"
20x11	154	"
20x10	170	"
18x12	160	7.5"
18x11	175	"
18x10	192	"
18x9	213	"
16x12	185	6.5"
16x11	201	"
16x10	222	"
16x9	246	"
16x8	277	"
14x12	218	5.5"
14x11	238	"
14x10	262	"
14x9	291	"
14x8	327	"
14x7	374	"
12x10	320	4.5"
12x9	356	"
12x8	400	"
12x7	457	"
12x6	534	"

Inventories vary with demand. For a size or thickness not listed, please contact our sales office.



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