

Renovation Synopsis

by Nik Epanchin

As most of the Point Arena Lighthouse Keeper, Inc. (PALKI) membership is probably aware, a major renovation of the Light Station was completed earlier this year. Each of the five Light Station buildings was scheduled for various improvements. A grant of \$1.2 million was obtained from California Cultural and Historical Endowment (CCHE). An additional matching \$300 thousand raised by PALKI yielded about \$1.5 million available for the renovation.

Architectural drawings were prepared by JZMK Partners of Irvine, CA. Construction bids were solicited and eventually awarded in May 2008. James Woodward, The lighthouse Consultant, LLC, of Cleveland, OH was awarded the disassembly and reassembly of the 1st order Fresnel lens system. Stark & Thornton Construction, Inc, of Albion CA, was awarded the balance of the work.



the relocated 1st Order Fresnel lens
(Nik Epanchin)

Work began in June 2008. First on the schedule were the repair of the 110 year old Fog Signal Building (FSB) and the disassembly and storage of the 100 year old 1st Order Fresnel lens and drive system. (The relocation of this priceless lens and drive system, a USCG national treasure, was planned many years prior since this system was deemed at risk in the lighthouse whose vulnerability to a major seismic event is unknown.) The FSB work had to be completed in order to accommodate the reassembly of the lens. No work could be started on the lighthouse itself until the entire lens system was disassembled and safely stored in the North Oil Storage Building (NOSB). Work on the remaining three buildings was independent and not tied to other renovation phases. This work consisted of the complete renovation of the restrooms including the tie-in to the existing leach field some 700 ft away, the conversion of the South Oil Storage Building (SOSB) to an employee lounge and storage area and the renovation of the NOSB.

The disassembly of the lens system which took Jim Woodward's crew about 2½ weeks and included the use of a 25 ton crane with a 135 ft boom was impressive. The lantern room perimeter consists of 16 panels, 5 of which were plywood installed years ago by the USCG to block the "unwelcomed and aggravating" light beam seen from shore by the neighboring communities. One of these plywood panels was removed to enable the lowering of each of the 24 lens sections and about 10 individual drive components through the 24 inch wide opening. Each section was unbolted, rigged with a sling, hooked to the crane, lowered about 100 ft to ground level and transported to the NOSB for storage. The heaviest drive piece weighed 2,150 pounds. Each lens component was then packed into a custom wooden box for safety.



(Nik Epanchin)

Meanwhile work on the FSB proceeded. Unfortunately it was discovered that the foundation of the whale watch room had severely deteriorated and had to be demolished and rebuilt. A similar problem was found in the office area. As a second thought, rather than storing the once state-of-the-art mercury bath lens drive system as originally planned, it was decided to reassemble it in the FSB museum on a foundation of its own. (The FSB did not have sufficient interior height to reassemble the lens on top of the drive as it had been for the prior 100 years.)



lens and drive foundations, west wall repairs and pony wall installations (Nik Epanchin)

Other FSB work included removal of all museum and gift shop displays, removal of old USCG equipment, pouring a new lens foundation with a pony wall around it, various electrical upgrades, reinforcement of the museum west wall, roof replacement, complete interior and exterior painting, installation of an electronic security and fire alarm system, replacement of the pellet stove and many minor improvements. The gift shop has been remodeled and is fully operational. Museum displays are currently being updated. Jim Woodward's team returned in November 2008 to reassemble the mercury drive and the Fresnel lens.

The lighthouse work included stripping the exterior paint, locating and repairing concrete where separation from the rebar had occurred, replacing the 5 plywood lantern panels with glass, repainting the entire interior, ie the buttress, stairs, interior walls, the watch room and the lantern room. First, tests were performed to see if water blasting the exterior paint using a 40,000 psi system could be used in lieu of sand blasting. (Compared to sand blasting, the environmental impact of water blasting is minimal and is somewhat less costly.) Although these tests turned out positive, even water blasting removed some of the sand and fine aggregates of the 100 year old concrete. Next scaffolding reaching close to 115 ft was erected and wrapped in Eagle wrap. With this in place, if not every square inch, certainly every square foot of the exterior concrete was gently tapped with a hammer to listen for sound differences indicating



(Nik Epanchin)

good concrete (concrete with an undisturbed bond to rebar) from concrete which, as result of rust and steel delamination, had suffered separation from the imbedded rebar and required repairs. The results indicated that the extent of damage needing repair was much more extensive than included in the bids. The tower itself was surprisingly free of damage; however the buttress and the entire gallery had substantial damage. (The final repaired square footage was over 5 times the bid square footage. This could not have been predicted without first erecting scaffolding.) Areas needing repairs were identified, their perimeters diamond sawed, the concrete chipped away to expose the rusted rebar, the rebar ground to shining metal (or at times replaced), sacrificial anodes installed, rebar coated, the area formed, grout injected and allowed to cure and the forms stripped.



grinding rebar (Nik Epanchin)

More unexpected damage was discovered after all the plywood lantern perimeter panels were removed. The exterior of the mullions (the vertical structural members supporting the lantern glass and roof) were not only badly pitted but they were out of plumb, making an inadequate seal with the glass panels, thus allowing moisture to infiltrate into the lantern room. It was decided to remove all the glass panels and repair each mullion. The 130 year old lantern copper roof salvaged from the original brick lighthouse presented additional problems. Large gashes were found at most of the exterior corner joints of the 16 roof sections. The center portion of the roof also showed age damage. Water damage was evident on the ceiling of the lantern room. PALKI was not successful in locating a contractor willing to repair and guarantee the repairs of this roof, so it was decided to replace the entire roof with new copper.



typical lighthouse roof damage (Nik Epanchin)



new lighthouse copper roof (Nik Epanchin)

Other lighthouse work included installation of a steel platform to bridge the lantern room hole where once the lens platen (base) was located, repair of the gallery walkway and guard rail, lighting and electrical system upgrade, and other minor improvements.

To cope with the unforeseen cost overruns, PALKI decided not to repaint the 130 year old interior stairs (also salvaged from the original brick lighthouse) and not to apply a parge coat (a type of grout used to smooth out the pitted exterior concrete surfaces resulting from paint removal using

high pressure water blasting) or the final elastomeric paint system to any of the exterior concrete surfaces. To protect the current renovation efforts and investments, this work should be done within the next few years and will require erecting another expensive scaffolding system. Currently the exterior concrete is protected only by an application of Ferrogard which reduces moisture infiltration into the concrete. This protection has a life expectancy of 2 to 4 years.

Through tireless work, prior PALKI Board members convinced the USCG to relocate its rotating beacon from the gallery level to the lantern room level and to move or abandon the “hut” at ground level, just west of the tower. As a result, the USCG moved all its ATON (Aid to Navigation) equipment into or just outside of the north side of the buttress and relocated both the primary and the backup rotating beacon lights to the lantern room exterior walkway. Most of the balance of the equipment remaining in the “hut” has been relocated to the FAA hut near the main light station entrance. Later this year, after the USCG relocates its main 40 ft antenna in the vicinity of the FAA “hut”, the USCG “hut” will be taken off site. A draw back to this beacon move is that the rotating beacon is now less visible from land. The rotating beacon was previously positioned outboard of and above the gallery’s concrete parapet, where as now it is positioned on the steel lantern room exterior deck very close to the lantern room glass. Both the old and the new rotating beacon locations are on the same radial as measured from the center of the lighthouse. The net effect of this move is that the overall visible arc has been reduced by a little more than 40° (from about 300° to less than 260°), enough to no longer be seen from some nearby northern and southern communities.



view from the completed lantern room – note the USCG beacon in the foreground (Nik Epanchin)



restored Fog Signal Building and lighthouse (Nik Epanchin)

To face the unforeseen overruns, in addition to curtailing the above mentioned tower repair work, most work related to both the SOSB and NOSB renovations was stopped. However the restrooms were upgraded as planned.

The table below summarizes all the above as of 25 Feb 09 in US \$1,000's and shows a \$31 thousand over run:

	CCHE 21 Jul 08	Actuals 25 Feb 09	CCHE less Actuals
Planning, Engineering & Construction Management	92.2	84.1	(8.1)
Fog Signal Building	372.0	400.8	28.8
Relocate Kiosk	-	2.7	2.7
Disassemble/reassemble Fresnel Lens & Drive System	195.6	184.8	(10.8)
Lighthouse Tower	580.9	697.3	116.4
Restrooms	119.4	111.8	(7.6)
South Storage Building	77.6	55.0	(22.6)
North Storage Building	26.9	9.1	(17.8)
Contingency	50.0	-	(50.0)
Total	1,514.6	1,545.6	31.0

Contractors involved in the restoration (in alphabetic order):

Mehl/Bishop Electric – main power relocation

Stark & Thornton Construction with the following subcontractors (in alphabetic order):

Alpha Restoration & Waterproofing – tower concrete repair

American Sheet Metal Partitions – restroom partitions

Branesky Sheet Metal – lighthouse copper roof

Certified Coatings – high pressure water blasting

Fort Bragg Electric – electrical

Gale Van Curren – plumbing

John Darcy Painting - painting

Noah's Arc Welding – metal fabrication

Randy's Custom Glass – lantern room glass

Redwood Roofers – FSB & restroom roofs

Thyssen Krupp Safway – scaffolding

The Lighthouse Consultant, LLC – disassembly & reassembly lens & drive system

PALKI Co-Project Managers (in alphabetic order):

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