



DEPARTMENT OF PUBLIC WORKS

Quality, Excellence, Innovation

Raul M. Rojas
DIRECTOR

September 10, 2014

Administration

PO Box 4186
San Rafael, CA 94913-4186
415 473 6528 T
415 473 3799 F
415 473 3232 TTY
CRS Dial 711
www.marincounty.org/pw

MERA Executive Board
95 Rowland Way
Novato, CA 94945

Re: Review of MERA Generators Shelter Options

Dear Directors:

At your May 7, 2014 meeting you requested review of an alternative to provide shelters for MERA generators to prolong their life. Below is a summary for you to discuss and provide further direction.

MERA maintains generators at various mountain top communications sites to supply emergency power. These generators are placed outside in a variety of environmental conditions which can significantly lessen the generator's life.

Based on an initial assessment done by DPW Communications Division there are certain generators that have not/will not meet the expected 15 to 20 year life cycle. As an example the generators at Bay Hill and Pt Reyes were replaced at the 12 year mark due to environmental and rodent damage. It could be expected that if a shelter was erected around certain generators that the 15 to 20 year life cycle could be realized.

As part of the on-going generator replacement program, a study to explore the feasibility of placing generators into purpose built "shelters" has been requested. The goals of this initial study would be:

- Conduct an assessment of each generator to determine site location, legal restrictions, and other variables that would impact building shelters.
- Produce design guidelines/performance specifications for MERA Generator Shelters
- Provide a concept design and detailed budgetary estimate for the design and construction of shelters for each site.
- Recommend a prioritized listing of generator shelters based on cost and other factors .

Each of these goals is discussed below.

Accounting

Airport

Building Maintenance

Capital Projects

Certified Unified Program Agency (CUPA)

Communications Maintenance

County Garage

Disability Access

Engineering & Survey

Flood Control & Water Resources

Land Development

Purchasing

Real Estate

Reprographic Services

Road Maintenance

Stormwater Program

Transportation & Traffic Operations

Waste Management

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Site Assessment

There are 10 MERA sites that potentially could employ shelters for their emergency generator. The Appendix includes a map showing the location of each generator and some photos that provide a general site context. The sites vary from suburban to very remote mountain top locations and in some cases there are extreme environmental conditions such as salt air, animal intrusions, high wind loads, etc. Most of the sites are on leased property and building shelters would likely require negotiations with the property owners. In some cases there may be physical restrictions that would require moving the generator to another location on the site. Each site is unique and would require a professional team to assess the situation and begin the planning process.

Shelter Design Specification Issues

Generator shelters require special features. Specifications would need to be developed to understand questions like the following;

- Generators produce exhaust that would need to be piped to the outside. Research would be required to understand how the ductwork would be attached to the generator and what materials would be used.
- Generators require fuel, often the tanks are built into the generator, sometimes they are in a separate location. How the generator is fueled and its impact on the shelter design would require study.
- Generators supply electricity to the MERA sites. What are the space requirements and how do the lines penetrate the shelter walls?
- How much lighting is needed in the shelters?
- Will environmental controls for temperature be required?
- How much space is needed around the generator to allow maintenance work to be performed?
- What type/size door would be required to allow the generator to be replaced?
- During generator operation would the structure require special ventilation?
- What loads would the concrete pad under the generator need to be designed for?
- Would special shielding/screening be required to protect against animal intrusion?
- Would the shelter need to be designed to reduce the noise produced during operation?
- Is there a mass produced butler building or tuff shed available that would meet the developed shelter specification?

These and other design issues would need to be worked out and approved. A deliverable from the study would be a general design specification that could be tailored for specific site locations.

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Concept Design and Budgetary Estimates

Based on the site assessments and general design specification, a customized concept design and budget estimate would be prepared for each generator location. A detailed task list and schedule would be produced that could serve as the basis for obtaining detailed design proposal(s).

Prioritized Implementation Recommendation

Similar projects being bid now by the County indicate a budgetary construction estimate of about \$150/SF. Based on this a 20 X 15 (300 SF) building would then cost about \$45,000. If there are 10 sites the total construction cost could easily approach \$500,000. With design and construction oversight and overall budget of say \$750,000 could be expected, plus the assessment cost described below. It seems unlikely that a project of this magnitude would be funded in one go and a more likely approach would be incremental funding based on prioritizing the sites according to need, cost, and timing considerations such as lease negotiations and permitting. The study would conclude with a prioritized implementation recommendation that would address this situation and provide a basis for the MERA Board to fully direct the next phase of this project.

Study/Implementation Budget & Schedule

DPW has done facility assessment studies recently that have ranged in cost from \$25,000 to \$100,000. We would expect something like the following:

- Site assessment – 20 hours each for 10 = 200 hours
- Shelter design specification by experienced professional = 40 hours
- Concept Design & Budget Estimates = 20 hours X10 = 200 hours
- Draft recommendations/report = 40 hours
- Final report= 20 hours

Say 500 hours @ \$150/hour = \$75,000

If direction to proceed is provided in September, the following might be possible for sites without major complications:

- Fall 2014 - If required develop RFP and get proposals
- Winter 2015 – Site Assessments
- Spring 2015 – Draft Study Report
- Summer 2016 – High Priority Sites Design/Legal Authorization
- Fall 2016 – High Priority Sites Construction

Very truly yours,


Craig Tackabery
MERA Operations Officer

Appendix "A"**MERA Generator Replacement Schedule**

<u>Site</u>	<u>Maintained By:</u>	<u>Size</u>	<u>Installed</u>	<u>Recommended Replacement Date</u>
Mt. Tiburon	MERA	45 KW	2005	2016
San Pedro Ridge	MERA	45 KW	2002	2014
Dollar Hill	MERA	45 KW	2002	2015
Forbes Hill	MERA	45 KW	2002	2015
Big Rock Ridge	MERA	45 KW	2002	2014
Sonoma Mt.	MERA	45 KW	2003	2015
Bay Hill Road	MERA	125 KW	2004	2014
Pt. Reyes	MERA	45 KW	2004	2014
Mt. Barnabe	MERA	45 KW	2003	2015
Stewart Pt.	MERA	45 KW	2007	2017

