



**Kennedy & Associates**  
CONSULTING CIVIL ENGINEERS

*Project Management  
Construction Management  
Program Management  
Engineering Services*

## Memorandum

Date: October 28, 2011  
To: Pat Cashman  
From: Frank Kennedy  
Subject: OAB Infrastructure Status – Maintenance (New)

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Pat,

At the request of the team we are generating an estimate for the regular maintenance of the new infrastructure.

### **Roadways**

A well designed pavement renovation based on dynamic modulus and deflection will result in a pavement whose life can be extended for decades with the proper periodic maintenance. Maintenance costs for Maritime Street, Burma Road and Wake Avenue are calculated using the pavement maintenance figures as provided by the Oakland Public Works Agency at a rate of \$0.55 sq/ft for preventative maintenance at 10 years and resurfacing at 20 years at \$2.22 sq/ft prolong the useable life of the roadway and its pavement structure.

The numbers for the streets in question have been broken down and are as follows:

#### Maritime Street

Maritime's long term maintenance program will result in an annualized cost of \$91,177 per year

#### Burma Road

Burma Road's long term maintenance program will result in an annualized cost of \$32,298 per year.

#### Wake Avenue

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Wake Avenue's long term maintenance program will result in an annualized cost of \$9,922 per year.

**Total Annual Maintenance Costs For New Roads**

<b>Maritime</b>	<b>\$91,177.32</b>
<b>Burma</b>	<b>\$32,298.20</b>
<b>Wake</b>	<b><u>\$ 9,922.14</u></b>
	<b>\$133,397.66 per year</b>

**Wet Utilities**

**Water System**

The replacement of the entire water system within the scope of the project will eliminate the operating cost that the City is currently paying due to leakage and for ongoing system maintenance. Typical practice in horizontal infrastructure development applies to this project. The new water system will be built as specified by East Bay Municipal Utilities District (EBMUD) standards. Upon completion of the system, the City will dedicate the system to EBMUD for acceptance. Maintenance of the system will be the responsibility of EBMUD.

**Total Maintenance Cost = \$0 per year**

**Sanitary Sewer System**

This assumes a new Sanitary Sewer system is installed along the centerlines of Maritime Street, Burma Road and Wake Avenue. we can calculate the Operation and Maintenance of these systems based on the figures provided by Oakland Public Works. The sanitary sewers are assumed to require hydro-blasting every other year.

Maritime Street

This results in a annualized maintenance cost for the Maritime sanitary sewer is \$13,842.

Burma Road

The annualized maintenance cost for the Burma sanitary sewer is \$12,749.

Wake Avenue

The annualized maintenance cost for Wake is \$5,222.

**The total maintenance cost annually for a new Sanitary Sewer system is \$31,813.00**

**Storm Sewer System**

This assumes a new storm sewer is installed to serve the design locations of the inlets and is a single line system with laterals to the drain inlets. Typical maintenance is annual cleaning of the inlets using a vacuum truck.

Maritime Street

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The annual maintenance cost of the Maritime storm sewer is \$7,302.

Burma Road

The annual maintenance cost for the Burma Road storm sewer is \$6,725.

Wake Avenue

The annual maintenance cost for the Wake storm drain is \$1,377.

**The Total maintenance cost annually for a new storm sewer system is \$15,404.**

### **Conclusion**

For the City to maintain new infrastructure on the redeveloped Oakland Army Base will cost annually the following:

Roads	\$133,397
Domestic water	\$ 0
Sanitary Sewer	\$ 31,813
Storm Sewer	\$ <u>15,404</u>
<b>Total</b>	<b>\$180,615</b>

This is, as expected, less than 10% of the cost to maintain the existing failed systems on the Base.