

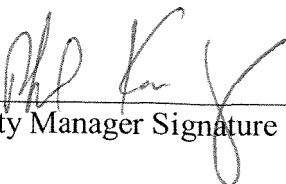
Office of the City Manager

TO BE DELIVERED AGENDA MATERIAL

Meeting Date: July 13, 2004

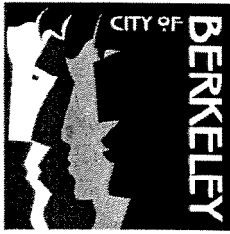
Item Number: No Number Assigned

Item Description: Creeks and Creek Culvert Information



City Manager Signature

(This cover sheet should be used only if the agenda item the material refers to was listed on the agenda as To Be Delivered)




Office of the City Manager

INFORMATION CALENDAR

July 13, 2004

To: Honorable Mayor and
Members of the City Council

From:  Phil Kamlarz, City Manager

Subject: Creeks and Creek Culvert Information

INTRODUCTION

This report focuses on creeks (open natural watercourses) and creek culverts (placement of a pipe or box shaped conduit in a creek bed for the purpose of conducting water in a natural watercourse) and should not be considered a report on storm drainage within the City. The City's storm drain pipe system has been largely excluded from this report.

The City built most of the creek culverts that pass under streets between 1900 and 1920. Private parties built creek culverts on private property to develop or improve the land during a similar period. Since the City did not start its permitting process for private property creek culverts until December 1928, very little information is available on private culverts built in the early days.

Creek culverts, both public and private, are reaching the end of their useful life of between 60-80 years. As the creek culverts age beyond their useful life, failures will start to be experienced causing damage to the public right-of-way or to private property.

CURRENT SITUATION AND ITS EFFECTS

Over the last ten years the City has experienced several incidents of culvert collapses or subsidence. Several years ago a section of the Strawberry Creek culvert collapsed in Civic Center Park. The Derby Creek culvert collapsed in 2000, and in 2004 a section of the Strawberry Creek culvert subsided in the Allston Way right-of-way near Harold Way. In 2002, another of its sections of private culvert collapsed near its outfall at the end of North Valley Street. The City can expect more collapses or subsidence as the creek culverts age.

BACKGROUND

The City of Berkeley has ten watersheds. From North to South, they are the Cerrito, Wildcat, Marin, Codornices, Gilman, Schoolhouse, Strawberry, Aquatic Park, Derby/Potter, and the Temescal Watersheds.

In the City, there are approximately 35,163 linear feet of creek culverts. Approximately half (17,768 linear feet) are on public property with 14,558 linear feet of these creek culverts located at street crossings. There are 39,859 linear feet of open watercourses. Of open watercourse, only 3,087 linear feet is on public property. The balance of 36,772 linear feet of open channel is

on private property. Table A summarizes seven of the ten watersheds indicating the length of both creek culverts and open watercourses and public and private property lengths. The remaining three watersheds do not contain defined creeks or creek culverts.

Table A

Watershed	Creek Culverts				Open Channels		
	Total Length Ft	Street Crossing Ft	Public Prop. Ft	Private Prop. Ft	Total Length Ft	Public Prop. Ft	Private Prop. Ft
Cerrito	3,457	596	0	2,861	4,767	118	4,649
Codornices	9,735	4,577	1,449	3,709	13,825	2,488	11,337
Derby/Potter	3,510	964	234	2,312	1,369	0	1,369
Marin	4,576	3,421	0	1,155	6,191	356	5,835
Schoolhouse	2,270	640	451	1,179	1,646	0	1,646
Strawberry	10,030	3,937	1,076	5,017	7,519	125	7,394
Temescal	1,585	423	0	1,162	4,542	0	4,542
TOTALS	35,163	14,558	3,210	17,395	39,859	3,087	36,772

Strawberry Creek (A Case Study)

The City has inspected the Strawberry Creek culverts from Oxford Street to the Bay. Strawberry Creek passes through public and private properties. Six areas of concern were identified.

The first area of concern is Oxford-Allston Way. This portion is 396 feet long and is both in the right-of-way and on private property. Sections of culvert bottom are eroding creating voids in the soil below. Also, this reach of culvert's concrete strength is marginal based on tests which have been performed. Lining is recommended for this section to give it additional strength and durability. The estimated cost is between \$5000-\$7000 per linear foot, or between \$1.98 million and \$2.8 million.

The second area of concern is at Allston Way at Harold Way. The ground around this section of culvert has subsided. This section is both in the right-of-way and on private property. An urgent repair is currently in progress. Design will be complete in the next couple of weeks. Once the drawings are ready, a permit application will be submitted to the regulatory agencies requesting an emergency permit so the work can be accomplished before October 15, 2004. The work in the right-of-way will be done by open trench while the portion on private property would need a liner. The repair of the 80 linear feet of right-of-way is estimated between \$400,000 and \$500,000. The 60 linear feet on private property is estimated between \$300,000 and \$420,000.

The third area is between McKinley and Roosevelt on both private and public property. The concrete bottom is eroding. Lining is recommended for this 699 linear foot section at \$3.5 million to \$4.9 million to rehabilitate.

The fourth area is in the public right-of-way between California and Sacramento. This reach of culvert's concrete strength was tested and has also deteriorated to marginal levels. This 567 linear foot section again should be lined at a cost of \$2.8 million to \$4.0 million to rehabilitate.

The fifth 300 linear foot area is on private property. This area is currently in litigation. A rough estimate is approximately \$1.0 million dollars to rehabilitate.

While outside the scope of this report, it should be noted that there is a section of storm drain pipe that is not a creek culvert, but rather, a large artificial storm drain pipe that conveys the water in Strawberry Creek as well as the Addison Street storm drain pipe from the intersection of Addison and Curtis to the Bay, mostly under University Avenue. This reach has tidal influence and the brackish water has started to corrode the rebar in certain spots, which also need to be lined at a cost of \$9.4 million to \$11.3 million.

POSSIBLE FUTURE ACTION

Based on the recent history of culvert failures, an inspection program should be implemented in the next two years for all public creek culverts. One hundred thousand dollars (\$100,000) a year would be needed to inspect and test public culverts. It would take about five years to inspect and test the 17,768 linear feet of public creek culverts. Once all the culverts have been initially inspected and tested, they would be re-inspected every five years or sooner if the initial inspection warrants it. This public inspection program has not been budgeted. The program should also require reports to be submitted by property owners for culverts on private property.

To extend the life of existing creek culverts, most could be lined. The current cost is \$5,000 to \$7,000 per linear foot. The shorter the culvert the more it will cost per foot. The costs could come down if various rehabilitation projects of similar type could be grouped together. Staff would also do research on alternate rehabilitation methods to help reduce costs.

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

The above inspection program would cost \$500,000 over five years. Over \$10 million dollars of rehabilitation work has already been identified by inspection and testing work done on Strawberry Creek culverts. Additional repair work needed at this time is estimated (very roughly) at an additional \$20 million. None of these estimated costs is budgeted at this time.

CONTACT PERSON

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Approved:



Rene Cardinaux, Director of Public Works