



**AGENDA**  
**Town of Atherton**  
**CITY COUNCIL/ATHERTON CHANNEL DRAINAGE**  
**DISTRICT**  
**March 13, 2013**  
**1:00 P.M.**  
**Town Council Chambers**  
94 Ashfield Road  
Atherton, California  
**Special Meeting**

**1:00 P.M.     ROLL CALL             Lewis, Carlson, Dobbie, Widmer, Wiest**

**1:02 P.M.     PUBLIC COMMENTS**

**1:15 P.M.     REGULAR**

- 1. MID-YEAR BUDGET ADJUSTMENTS REPORT FOR FY 2012-2013**  
**Report:** Finance Director Robert Barron III  
**Recommendation:** Receive and file Mid-year Budget Report for the General Fund for Fiscal Year 2012-2013.
  
- 2. MARSH ROAD CHANNEL REPAIRS DISCUSSION**  
**Report:** Public Works Director Gordon Siebert  
**Recommendation:** To Be Determined

**4:30 P.M.     ADJOURN**

Pursuant to the Americans with Disabilities Act, if you need special assistance in this meeting, please contact the City Clerk's Office at (650) 752-0500. Notification of 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting. (29 CRF 35.104 ADA Title II)



**AGENDA**  
**Town of Atherton**  
**CITY COUNCIL/ATHERTON CHANNEL DRAINAGE**  
**DISTRICT**  
**March 14, 2013**  
**1:00 P.M.**  
**Town Council Chambers**  
94 Ashfield Road  
Atherton, California  
**Special Meeting**

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## Town of Atherton

### **CITY COUNCIL STAFF REPORT**

**TO: HONORABLE MAYOR AND CITY COUNCIL  
GEORGE RODERICKS, CITY MANAGER**

**FROM: ROBERT BARRON III, FINANCE DIRECTOR**

**DATE: MARCH 13, 2013**

**SUBJECT: MID-YEAR BUDGET REPORT FOR FY 2012-2013**

#### **RECOMMENDATION**

Receive and file the Mid-Year Budget Review for the General Fund for Fiscal Year 2012-2013.

#### **DISCUSSION**

The Town has received the first installment of General Fund tax revenues. The review of actual revenue and expenditures for month ending February 28, 2013 was completed. Staff submitted expected revenue increases as well as operation expenditures projections within departments for the remainder of Fiscal Year 2013. Exhibits A and B contain the details of the projected revenues and expenditures at Mid-Year.

**Revenue** - The General Fund expects an overall increase in operating revenue of \$967,102. Property taxes reflect an increase of \$558,474 above the adopted budget. This amount is in line with the early County projected increase of about 8%. Town sales taxes are expected to increase by \$31,000. This is due to Prop 172 Sales Tax revenues for public safety and the "triple flip" in lieu sales tax. Franchise fees are projected to decrease by \$18,751 with projections that garbage franchise fees will be below budget by \$23,300 however we expect a \$4,550 increase in cable franchise fees.

The Table below illustrates the property taxes Mid-Year adjustment breakdown.

Account Number	Description	Budget FY 2013	Mid-Year Adjustment	Projected FY 2013
	<b>Revenues</b>			
101-00-40001-000	Secured Property Tax	5,038,000	<b>156,000</b>	5,194,000
101-00-40002-000	Unsecured	278,000	<b>90,000</b>	368,000
101-00-40004-000	SB813 Redemption (Suppl)	70,000		70,000
101-00-40006-000	Prop Tax in Lieu of VLF (motor vehicle)	680,000	<b>65,874</b>	745,874
101-00-40008-000	Excess ERAF	695,000	<b>197,000</b>	892,000
101-00-42005-000	Property Transfer Tax	255,000	<b>49,600</b>	304,600
	Total Property Taxes	7,016,000	<b>558,474</b>	7,574,474

Secured property tax revenue the past three years has been between \$4,700,000 and \$4,900,000. HDL Companies presented a property tax analysis that indicated that the increase in total property taxes can be attributed to the 9.03% growth in the net taxable assessed property value.

Zoning and planning fees are at 82.1% of budget and are projected to be \$21,555 above budget. Although we are entering the beginning season for building and construction, overall building revenue is estimated to be down by \$186,900. This could change as building revenues may recover before fiscal year end. Current Building Permit Fees received as of February 2013 are \$525,350 to a budget of \$903,900. The projected other revenues categories such as Intergovernmental, Police Revenue, DPW Revenue and Park Program Revenue are projecting a total increase of \$13,596.

In addition to regular revenue and increases, the General Fund also received one-time revenues that include \$350,000 mitigation funds from Facebook and \$184,081 for Settlement Claims net of attorney expenses for the Fletcher/Ridgeview project. This is a total of \$534,081 for one-time revenues.

**Expenditures** - The overall operating expenditures to the General Fund has a projected net decrease of \$126,000. The table below summarizes the proposed changes.

Account Number	Description	Amended Budget FY 2013	Mid-Year Adjustment	Projected FY 2013
	<b>Expenditures</b>			
101-11	City Council Department	\$ 59,530	\$ -	\$ 59,530
101-12	Administration Department	772,215	(100,030)	672,185
101-16	City Attorney Department	204,100	-	204,100
101-18	Finance Department	683,783	(1,120)	682,663
101-20	Planning Department	235,600	(1,000)	234,600
101-25	Building Department	1,242,717	41,514	1,284,231
101-30	Non-Department	765,867	1,025	766,892
101-40	Police Department	5,463,061	(48,088)	5,414,973
101-50:59	Public Works Department	1,448,933	(18,300)	1,430,633
		<b>\$10,875,806</b>	<b>\$ (125,999)</b>	<b>\$10,749,807</b>

The details for department Mid-Year expenditure adjustments are listed in Exhibit B. The Administration Department is projecting a decrease of \$100,030 in expenditures, a majority of which is from a decrease of other contractual services that was budgeted for contingency.

The Finance Department is projecting a net decrease in expenditures of \$1,120 - reduced operational expenses mainly offset by an increased for Other Contractual Services. The Planning Department \$1,000 decrease is in advertising/noticing budget of \$2,000.

The Building Department expenditures are projecting an increase to Regular Salaries and Benefits of \$50,020 in part due to the salary and benefit allocation for the Associate Engineer not being properly recorded between the engineering and building departmental budgets. There is an increase in Technical Service expense of \$74,432 for the grading and drainage plan performed by BKF Engineers. The consultant services agreement was approved by council on June 20, 2012 but not recorded in the budget.

As was mentioned with a projected decrease in building permit revenue of approximately \$190,000, the Contract Building and Life Safety expense is estimated at a \$90,000 decrease. If building department revenues increase in the next couple of months, there will be a correlated increase in expense. The contract for building department services is 58% of building related revenues.

The Public Works Building Departments are estimating a net decrease in expenditures of \$18,300. Estimated departmental expenditure reductions are offset budget expense needs within its operations. One such expense increase was for Street Light Repair & Maintenance expense.

Non-Department expenditures increase was due to a contribution to HIP Housing's yearly contribution that increased \$1,025 for a FY 12-13 contribution of \$2,275.

The Police Department has a proposed net savings of \$48,088, mainly due to a reduced PERS retirement contribution expense due changes in staffing. There was a reduction in San Mateo County Animal Control cost in the amount of \$5,278. The net savings within the department covers increased line item costs such as potential benefits payout, utilities, and training expenses.

### **FISCAL IMPACT**

The overall fiscal impact to the General Fund as a result of all the proposed adjustments in revenues and expense savings is a net increase to projected fund balance of \$1,093,100. With this net increase the Fiscal Year 2013 year-end fund balance is projected to be \$1,533,708.

As we approach the end of Fiscal Year 2013, Finance will make assumptions on General Fund revenues based on historical trends coupled with current market conditions to forecast for future years. We will do the same for expenditures such as overhead expense items such as retirement rates and operational expenses increases. This will give the Council a 5-year revenue/expenditure projection.

The City Manager is authorized to make budget transfers within the same department but any transfers between departments or separate funds requires the approval of the City Council. There are no inter-department or inter-fund transfers necessary.

Budget amendments are not necessary to reflect increases in revenues or decreases in expenditures; however, a budget amendment is necessary to reflect changes in expenditures that go beyond the approved budget. Changes within the Building Department related to the BKF Project and the incorrect allocation for the Associate Engineer need to be corrected with a budget amendment. Staff will return a budget amendment to the Council at the March 20 City Council Meeting to make these adjustments.

Prepared by:

Approved by:

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Robert Barron III  
Finance Director

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George Rodericks  
City Manager

Attachment:

1. Resolution of the City Council of the Town of Atherton Approving Mid-year FY 2012-2013 Budget Adjustment
  - Exhibit A General Fund Mid-Year 2013 Revenues & Expenditures Review
  - Exhibit B General Fund Mid-Year 2013 Summary of Expenditure Adjustments
2. Building Department Summary

Town of Atherton						Exhibit A
General Fund						
Mid-Year Revenues and Expenditures Review						
FY 2012-2013						
Account Number	Description	Adjusted Budget FY 2013	66.7% Adj. Actual Jul 12 thru Feb 13	% of Annual Budget	Mid-Year Adjustment	Projected FY 2013
	<b>Revenues</b>					
101-00-40001-000	Secured Property Tax	5,038,000	2,904,393	57.6%	156,000	5,194,000
101-00-40002-000	Unsecured	278,000	306,592	110.3%	90,000	368,000
101-00-40004-000	SB813 Redemption (Suppl)	70,000	55,517	79.3%		70,000
101-00-40006-000	Prop Tax in Lieu of VLF (motor vehicle)	680,000	372,937	54.8%	65,874	745,874
101-00-40008-000	Excess ERAF	695,000	892,094	128.4%	197,000	892,000
101-00-42005-000	Property Transfer Tax	255,000	205,078	80.4%	49,600	304,600
	<b>Total Property Taxes</b>	<b>7,016,000</b>	<b>4,736,611</b>	<b>67.5%</b>	<b>558,474</b>	<b>7,574,474</b>
101-00-41001-000	Sales & Use Tax General	115,500	78,361	67.8%		115,500
101-00-41004-000	In Lieu Sales Tax/Trip Flip	62,400	36,893	59.1%	11,000	73,400
101-00-41002-040	Prop 172 Sales Tax for Police	26,500	42,790	161.5%	20,000	46,500
	<b>Total Sales Taxes</b>	<b>204,400</b>	<b>158,043</b>	<b>77.3%</b>	<b>31,000</b>	<b>235,400</b>
101-00-42001-000	Franchise Taxes-PG&E	230,000	-	0.0%		230,000
101-00-42002-000	Franchise Tax-Cal Water	104,500	-	0.0%		104,500
101-00-42003-000	Franchise Tax-Garbage	330,000	204,852	62.1%	(23,300)	306,700
101-00-42004-000	Franchise Taxes-Cable	110,000	57,274	52.1%	4,550	114,550
	<b>Total Franchise Fees</b>	<b>774,500</b>	<b>262,125</b>	<b>33.8%</b>	<b>(18,750)</b>	<b>755,750</b>
101-00-40005-000	Homeowners Exemption	34,000	17,908	52.7%		34,000
101-00-40007-000	Motor Veh. Lic Fees (MVLF)	-	3,872	n/a	3,872	3,872
	<b>Total Intergovernmental</b>	<b>34,000</b>	<b>21,781</b>	<b>64.1%</b>	<b>3,872</b>	<b>37,872</b>
101-00-43001-000	Business Licenses	160,000	139,220	87.0%		160,000
	<b>Total Business License Tax</b>	<b>160,000</b>	<b>139,220</b>	<b>87.0%</b>	<b>-</b>	<b>160,000</b>
101-00-47001-000	Home Occupation Permit	800	-	0.0%		800
101-00-47019-020	Zoning & Planning Fees	153,000	125,569	82.1%	21,555	174,555
	<b>Total Planning Revenue</b>	<b>153,800</b>	<b>125,569</b>	<b>81.6%</b>	<b>21,555</b>	<b>175,355</b>
101-00-47002-025	Building Permit Fee	903,900	525,350	58.1%	(190,000)	713,900
101-00-47021-025	Building Plan Check Fee	374,900	223,619	59.6%	(14,000)	360,900
101-00-47034-025	Contract Plan Review Services	-	-	n/a		-
101-00-47004-025	Grading & Drainage	60,000	38,836	64.7%	6,600	66,600
101-00-47030-025	Tree Removal Plan Check	15,000	19,761	131.7%	10,500	25,500
101-00-47009-000	Photocopy Fee	1,000	1,076	107.6%		1,000
	<b>Total Building Revenue</b>	<b>1,354,800</b>	<b>808,642</b>	<b>59.7%</b>	<b>(186,900)</b>	<b>1,167,900</b>
101-00-44001-040	Municipal & Vehicle Code Fines (Parking)	15,000	9,470	63.1%		15,000
101-00-44002-040	Other Fines & Forfeiture (County)	40,000	22,088	55.2%		40,000
101-00-45007-040	POST Reimb	7,500	10,072	134.3%	3,000	10,500
101-00-45008-000	SB 90 Reimbursement		1,083		1,083	1,083
101-00-45011-040	DOJ Grant (vests)			n/a		-
101-00-45012-040	DUI Grant	6,000	1,309	21.8%	(3,000)	3,000
101-00-45017-040	ABAG Grant	7,000	7,891	112.7%	891	7,891
101-00-47005-040	Other Licenses & Permit	400	274	68.5%		400
101-00-47009-040	Photocopy fee		18	n/a		-
101-00-47011-040	Alarm Sign Fees	600	380	63.3%		600
101-00-47012-040	Vehicle Release	2,500	4,543	181.7%	3,000	5,500
101-00-47013-040	Police Report	1,000	39	3.9%	(900)	100

Town of Atherton						Exhibit A
General Fund						
Mid-Year Revenues and Expenditures Review						
FY 2012-2013						
Account Number	Description	Adjusted Budget FY 2013	66.7% Adj. Actual Jul 12 thru Feb 13	% of Annual Budget	Mid-Year Adjustment	Projected FY 2013
101-00-47014-040	Finger Printing Fee	325	62	19.1%	(150)	175
101-00-47015-040	Affidavit of Cost	300	550	183.3%		300
101-00-47016-040	Special Service Fee	3,000	1,349	45.0%		3,000
101-00-47017-040	Solicitor's Permit	100	176	176.0%		100
101-00-47018-040	DUI Enforcement			n/a		-
101-00-47018-040	Disaster Assistance Reimbursement	-		n/a		-
101-00-48501-040	Donations	-		n/a		-
101-00-48502-040	Miscellaneous Income	-		n/a		-
	<b>Total Police Revenue</b>	<b>83,725</b>	<b>59,305</b>	<b>70.8%</b>	<b>3,924</b>	<b>87,649</b>
101-00-47003-050	Encroachment	168,000	106,051	63.1%		168,000
101-00-45005-050	C/CAG AB 1546	12,535	6,702	53.5%		12,535
101-00-45017-050	PW ABAG Grant	-	12,400	#DIV/0!	12,400	12,400
101-00-45019-050	Grants DPW	5,000	-	0.0%		5,000
101-00-47009-050	Photocopy Fee		-	#DIV/0!		-
101-00-45021-053	Highway Maintenance Reimbursement	35,700	-	0.0%		35,700
101-00-48503-053	Property Damage Reimbursement	-	-	n/a		-
	<b>Total DPW Revenue</b>	<b>221,235</b>	<b>125,152</b>	<b>56.6%</b>	<b>12,400</b>	<b>233,635</b>
101-00-47022-058	Social Fees	35,000	17,713	50.6%	(8,000)	27,000
101-00-47023-058	Meeting Fees	30,000	16,900	56.3%	(4,000)	26,000
101-00-47025-058	Class Fees	10,000	14,000	140.0%		14,000
101-00-47028-058	Weddings		-	#DIV/0!		-
101-00-47029-058	Park Day Use Fee	-		n/a		-
101-00-47024-058	Misc. Use Fee	1,000	2,400	240.0%	1,400	2,400
	<b>Total Park Program Revenue</b>	<b>76,000</b>	<b>51,013</b>	<b>67.1%</b>	<b>(6,600)</b>	<b>69,400</b>
101-00-45016-025	Grant			n/a		-
101-00-45017-000	ABAG Grant	-		n/a		-
101-00-47005-000	Application Fee			n/a		-
101-00-47005-000	Other Licenses & Permit			n/a		-
101-00-47009-000	Photocopy Fee	25		0.0%		25
101-00-47036-030	Administrative Citation-Code Enforcement	-		n/a		-
101-00-48001-000	Interest Income	65,000	35,892	55.2%		65,000
101-00-48002-000	Cell Antenna Lease	41,682	29,002	69.6%		41,682
101-00-48003-000	Property Rental - Playschool	77,600	58,588	75.5%		77,600
101-00-48004-000	Sale of Property	-	33	n/a		-
101-00-48005-000	Post Office	7,500	4,800	64.0%		7,500
101-00-48501-000	Donations/Contributions		-	n/a		-
101-00-48502-000	Miscellaneous Income	5,000	2,170	43.4%		5,000
101-00-48505-000	Escheated unclaimed property		-	n/a		-
101-00-48506-000	Mitigation Fees		350,000	#DIV/0!	350,000	350,000
101-00-48507-000	Settlement Claims		184,081	#DIV/0!		184,081
101-00-45020-000	Other Reimbursements		14,045	n/a		14,045
	<b>Total Misc. Revenues</b>	<b>196,807</b>	<b>678,611</b>	<b>344.8%</b>	<b>548,126</b>	<b>744,933</b>
	<b>Total Operating Revenues</b>	<b>10,275,267</b>	<b>7,166,071</b>	<b>69.7%</b>	<b>967,102</b>	<b>11,242,369</b>

Town of Atherton						Exhibit A
General Fund						
Mid-Year Revenues and Expenditures Review						
FY 2012-2013						
Account Number	Description	Adjusted Budget FY 2013	66.7% Adj. Actual Jul 12 thru Feb 13	% of Annual Budget	Mid-Year Adjustment	Projected FY 2013
	<b>Expenditures</b>					
	City Council Department	59,530	22,804	38.3%		59,530
	Administration Department	772,215	352,914	45.7%	(100,030)	672,186
	City Attorney Department	204,100	102,612	50.3%	-	204,100
	Finance Department	683,783	341,911	50.0%	(1,120)	682,663
	Planning Department	235,600	127,114	54.0%	(1,000)	234,600
	Building Department	1,242,717	773,468	62.2%	41,514	1,284,231
	Non-Department	765,867	488,798	63.8%	1,025	766,892
	Police Department	5,463,061	3,511,669	64.3%	(48,088)	5,414,973
	Public Works Department	1,448,933	772,489	53.3%	(18,300)	1,430,633
	<b>Total Operating Expenditures</b>	<b>10,875,807</b>	<b>6,493,780</b>	<b>59.7%</b>	<b>(125,999)</b>	<b>10,749,808</b>
	<b>Excess (Deficiency) of Revenues Over Expenditures</b>	<b>(600,540)</b>	<b>672,291</b>	<b>-111.9%</b>	<b>1,093,100</b>	<b>492,561</b>
	<b>Other Financing Sources/(Uses)</b>					
	Transfer in from Special Parcel Tax Fund	1,116,000	744,000	66.7%		1,116,000
	Transfer out to Tennis Fund (105)	(4,853)	(3,235)			
	Transfer out to CIP (401)	(70,000)	(46,667)			
	<b>Total Transfers In</b>	<b>1,041,147</b>	<b>694,098</b>	<b>66.7%</b>	<b>-</b>	<b>1,116,000</b>
	<b>Net Change in Fund Balance</b>	<b>440,607</b>	<b>1,366,390</b>	<b>310.1%</b>	<b>1,093,100</b>	<b>1,533,708</b>
	Beginning Fund Balance	6,204,150	6,204,150			6,204,150
	Ending Fund Balance	6,644,757	7,570,540	113.9%	1,093,100	7,737,858
	<b>Analysis of Fund Balance:</b>					
	Budget Stabilization Reserve (15%)	1,631,371			(18,900)	1,612,471
	Emergency Disaster Reserve (15%)	1,631,371			(18,900)	1,612,471
	Working Capital (5%)	543,790			(6,300)	537,490
	Community Tree Plant & Maintenance	4,854				4,854
	Undesignated, Unreserved	2,104,460			1,396,954	3,501,414
		5,915,846	-	-	1,352,855	7,268,700
	Building Department Operating Reserve	728,911			(259,754)	469,157
		6,644,757	-	-	1,093,100	7,737,858

Town of Atherton		
Summary of Expenditure Adjustments		<b>Exhibit B</b>
General Fund Mid-Year Review		
		Mid-Year Adjustment
<u>Administration Department</u>		
Reduce Other Equipment Repair & Maintenance	(1,085)	
Reduce Utilities Gas	(395)	
Reduce Advertising/Noticing	(1,550)	
Reduce Membership/Dues	(3,663)	
Other Contract Services	(93,863)	
Additional Cost Postage	526	
		(100,030)
<u>Finance Dept</u>		
Reduce Other Equipment Repair & Maintenance	(500)	
Reduce Printing External Service	(920)	
Reduce Banking Service Charge	(4,500)	
Reduce Subscriptions	(500)	
Reduce Mileage Reimbursment	(300)	
Increase Other Contract Services-Accounting Technician	6,500	
Reduce Office Supplies	(700)	
Reduce Misc. Computer Parts/Supplies	(200)	
	-	
		(1,120)
<u>Planning Dept</u>		
Reduce Advertising/Noticing	(1,000)	
		(1,000)
<u>Building Dept</u>		
Regular Salaries & Employee Benefits-Allocation Adj Assoc. Engineer	50,020	
Increase Technical Services-grading & drainage plan	74,432	
Decrease Contract Bldg & Life Safety due to decrease in Revenue	(90,000)	
Increase Other Equipment Repair & Maintenance	1,362	
Increase Other Contract Services	2,200	
Increase Office Supplies	3,500	
		41,514
<u>Public Works Dept</u>		
Reduction to Contract Engineering	(12,295)	
Reduce Other Equip Repair & Maintenance	(615)	
Reduce Contract Inspection & Testing	(3,000)	
Reduce Conferences Expense	(220)	
Reduce Postage	(700)	
		(16,830)
<u>Dept 53-Street Maintenance</u>		
Reduce vehicle repairs & maintenance	(600)	

Town of Atherton		
Summary of Expenditure Adjustments		<b>Exhibit B</b>
General Fund Mid-Year Review		
		<u>Mid-Year Adjustment</u>
Increase cost Street Light Repair & Maintenance	8,460	
Reduce Advertising/Noticing	(2,800)	
Reduce Rent Machinery & Equipment	(2,000)	
Reduce Conferences Expense	(500)	
Reduce Training & Workshops	(300)	
Increase Oil & Gas Expense	700	
Reduce Office Equipment & Furniture	(500)	
		2,460
Dept 57-Park Maintenance		
Reduce Facility Repair & Maintenance	(5,000)	
Increase Contract Custodial Services	120	
Increase Utilities-Sewer	750	
		(4,130)
Dept 58-Park Program		
Increase Custodial Supplies	200	
		200
Total Department of Public Works		(18,300)
<u>Police Dept</u>		
Vacation/Comp Time Payout for possible payout	20,000	
Reduce PERS retirement Contribution-ER due to not fully staffed dept	(90,000)	
Increased cost utilities-Electricity	4,300	
Increased cost utilities-Gas	280	
Increased cost utilities-Water	465	
Increased cost utilities-Telephone	1,160	
Increased cost training-Post Sworn	985	
Reduced Animal Control-County Cost decreased	(5,278)	
Disaster/Emergency Fund	20,000	
		(48,088)
<u>Non-Departmental</u>		
Contribution to HIP-annual contribution increase	1,025	
		1,025
Total Mid-Year Expenditure Increase		\$ (125,999)

Town of Atherton		Attachment 2
Projected Building Department Revenues & Expenditures		
FY 2012-13		
Revenues		\$ 1,167,900
Expenditures	1,284,231	
City Attorney Service (estimate)	15,000	
Cost Allocation of 10%	128,423	1,427,654
Deficiency of Revenues over Expenditures		(259,754)
Building Dept Operating Reserve, 6/30/12		728,911
Projected Building Dept Operating Reserve, 6/30/13		\$ 469,157
Building Reserve Target - per FY 2012 budget of core operations		\$ 728,911
Notes:		
The Revised FY 2012 Budget estimated that the Building Department Reserve would be \$614,949. Based on staff's analysis of projected revenues and expenditures through June 30, 2012 the projected Building Fund Reserve is estimated to be \$636,233.		



## Town of Atherton

### CITY COUNCIL STAFF REPORT

TO: HONORABLE MAYOR AND CITY COUNCIL  
GEORGE RODERICKS, CITY MANAGER

FROM: GORDON SIEBERT, CITY ENGINEER

DATE: MARCH 13, 2013

SUBJECT: MARSH ROAD CHANNEL REPAIRS WORKSHOP

### **RECOMMENDATION**

1. Conduct a Workshop on the Marsh Road (Atherton) Channel Repair Project
2. Receive and file Marsh Road Channel Repair Project Report.
3. Provide staff with direction on a preferred alternative.
4. Direct staff to solicit a proposal from Biggs Cardosa Associates, Inc. for Phase II design.

### **BACKGROUND**

In September, 2012, City Council authorized the City Manager to execute a contract with Biggs Cardosa Associates, Inc. (BCA) for analysis and preliminary design services for the Marsh Road (Atherton Channel) Retaining Wall Design (Phase I) in the amount of \$78,102. BCA conducted the study by analyzing the existing Channel's condition and then modeling each of four preliminary designs outcomes based on current hydrology (storm water quantities) and hydraulics (Channel capacity). BCA analyzed various factors of cost, construction impacts, longer-term impacts and other qualitative factors. Two alternatives stand out as superior, based on their ability to implement repairs at least cost (both at approximately \$2.1 million): Option 2A, Cast-in-place and Option 3, Soil Nail Wall.

### **FINDINGS**

The current Channel carries a storm of less than 10 year size and the box culvert at Middlefield Road limits the flows into the Channel as well. However, staff requested the consultants to consider the capability of adding a parallel pipe to increase the Channel's capacity at some time in the future. This may become necessary in order to mitigate adjacent flooding when the Channel overtops its bank. As a result of this analysis, BCA evaluated the factor of a future Culvert and assigned a score of 1 to the Soil Nail Wall and a 3 to the Cast-in-Place Wall. The

other differences between the two least-cost options are the temporary impacts of additional traffic detouring during construction and cutting back of some tree limbs to improve access for the concrete pouring equipment, and some potential additional maintenance of the cast-in-place wall.

The Marsh Road portion of the Atherton Channel has deteriorated and is in need of repair. All options meet the highest need to improve public safety. Other factors including impacts during construction and future durability, maintenance and capacity for expansion were scored. None of the scored factors were weighted. While BCA scored the Soil Nail Wall highest, staff suggests that the ability to add a parallel pipe at some point in the future will be very important. The Soil Nail Wall option precludes this ability. Therefore staff recommends Option 2A, which costs the same as the highest-scoring option but which has slightly less favorable impacts during construction. BCA will be prepared to discuss all alternatives, and especially to compare the two least-cost options.

**FISCAL IMPACT:**

The 2012-13 Capital Improvement Program includes \$850,000 in the Marsh Road Retaining Wall project, which is sufficient funding to complete design of the recommended option. Funds for remaining design, construction and construction management are included in the FY 2013-14 and FY 2014-15 CIP and total \$2,450,000 in all three fiscal years.

Prepared By:

Approved:

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Gordon Siebert  
City Engineer

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George Rodericks  
City Manager

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Attachment A - Site Plan

Attachment B - General Plans

Attachment C - Engineer's Estimate

Attachment D - Working Day Schedule

Attachment E - Field Review Memorandum

Attachment F - Geotechnical Investigation Memorandum

Attachment G - Hydraulic Investigation Memorandum

Attachment H - Biological Constraints Memorandum

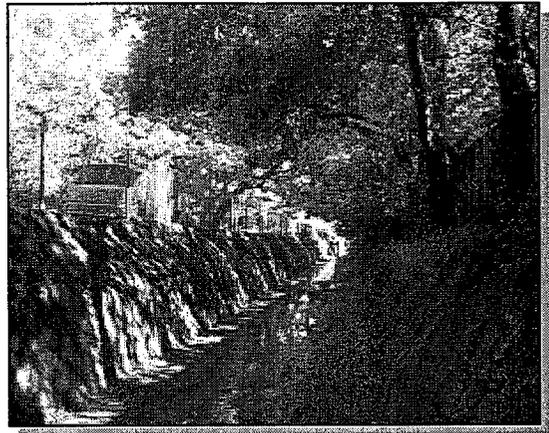
Attachment I - Tree Memorandum

## 1. Project Description

The Town of Atherton (Town) owns the right-of-way and maintains the existing Atherton Channel located along Marsh Road between Middlefield Road and Fair Oaks Avenue. The existing channel was constructed in the 1940s and 1960s and is in need of replacement due to significant distress (See Attachment E: Field Review Memorandum for additional details on existing channel condition). The existing open channel is trapezoidal in shape and approximately 1,805 feet in length. The existing channel is comprised of battered stone and mortar walls with a cast-in-place concrete invert slab.

Only limited as-built record data related to the channel are available. Field surveys were performed and the following stationing and nomenclature was established for the project:

- Station 0+00 was assigned to the upstream end of the channel starting at the face of the existing box culvert at Middlefield Road.
- Station 18+05 was assigned to the downstream end of the channel terminating at the face of the existing box culvert near Fair Oaks Avenue.
- Left and right bank were assigned looking downstream with the west bank (adjacent to Marsh Road) being designated the left bank and the east bank (adjacent to residential properties) being designated the right bank.



The west bank (left bank) of the channel is located immediately adjacent to the shoulder of Marsh Road. Marsh Road traffic is separated from the channel by a 10-inch high stone and mortar curb and 4-foot high chain link fence. The west bank of the channel is typically taller than the east bank with a height varying between a low of roughly 6-feet and a high of roughly 10-feet. Wall batter varies and is typically sloped in the lower portion of the wall and near vertical towards the top.

The east bank (right bank) of the channel is fairly constant in depth with an average height of roughly 5-feet for the majority of its length with a short segment of roughly 7-feet near Middlefield Road. Wall batter is on the order of roughly 2 to 2.5 feet. The top of the east bank has a 4.5 to 8.5 foot wide bench between the channel and the existing property line fences/ walls. This bench is fairly heavily vegetated with a variety of trees, including several large heritage trees, and other shrubs and flowers.

The channel invert consists of a thin cast-in-place concrete invert slab over an unknown depth of drain rock. Small floor drains exist at select locations. These facilities appear to have been added to the invert slab at a later date presumably to address localized drainage issues. Channel invert width varies along the length from a minimum of roughly 8 feet to a maximum of roughly 12 feet.

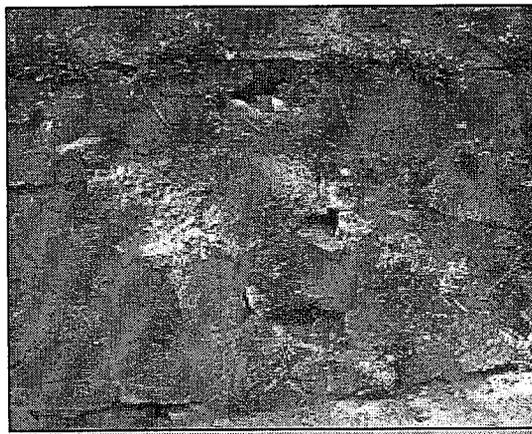
Type Selection Memorandum  
Marsh Road Channel Repair Rehabilitation

The upstream end of the channel is bounded by a single cell box culvert (13.5 ft wide by 5 ft tall) at Middlefield Road. The downstream end of the channel terminates into a double cell (10 ft wide by 4.5 ft tall) box culvert which runs under Marsh Road beginning roughly at the intersection with Fair Oaks Avenue. Channel transitions from open trapezoidal channel to box culverts are facilitated via short segments of sack concrete slope protection to transition from battered to near vertical channel side slopes.



The project site is surrounded primarily by residential housing. The east bank is bordered by a series of private residences which are separated from the channel by a series of private fences and walls. These facilities are comprised of a combination of timber, steel, concrete and masonry. Several back yard structures could be seen in the field and via review of available aerial mapping, including pools, pool houses, tennis courts, carports and other above ground facilities. The west bank is bordered by Marsh Road and the west side of Marsh Road is bordered by residential housing with driveways opening onto Marsh Road. Middlefield Road is also bordered by residential housing. North of Fair Oaks Avenue the use includes gas stations and multi-family housing.

It is our understanding that due to funding constraints that construction of the proposed channel replacement will likely occur in spring 2015 at the earliest. Given the existing channel condition and level of distress of the west (left) wall, and prior emergency repair of that wall in 2008 (see Attachment E: Field Review Memorandum), it is recommended that regular channel inspection and maintenance be performed by the Town until the channel replacement is complete. Activities should include monitoring all significant cracks and bulges in the walls, and patching of all significant voids in the walls and invert slab.



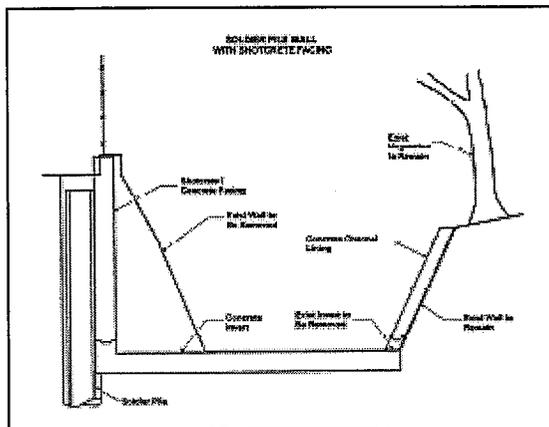
## 2. Structure Type

In coordination with the Town, the following three structural channel replacement options were identified as being the best suited to meet the unique project constraints along Atherton Channel. In general the replacement of the west (left) wall governs the design and each option is named after the proposed structural solution along the west (left) wall. See Attachment B: General Plans for conceptual plan, elevation and typical section of proposed improvements.

### Option 1: Soldier Pile Wall

This wall type finds common use in locations where top down construction is desirable or there is minimal footprint available for the construction of a cantilever retaining wall foundation. This wall type consists of vertical steel soldier piles cast in drilled holes and backfilled with concrete and lean concrete backfill. Timber or precast concrete lagging provides temporary excavation support between soldier piles and serves as the rear form for cast-in-place concrete or shotcrete facing which completes the wall. Wall drainage is provided by geocomposite drain strips and weep holes located between adjacent soldier piles. A cast-in-place concrete or shotcrete invert channel is typically provided to prevent undermining of the completed wall.

This structure type is best suited for the west (left) wall of the channel adjacent to Marsh Road where construction access is greatest and overhead conflicts from trees are minimal. This option eliminates the existing west (left) wall batter which provides additional hydraulic capacity which will allow the east (right) bank to consist of a trapezoidal channel lining cast over the existing channel wall. By casting the new wall over the old wall, slope stability and tree impacts associated with removal of the wall are eliminated.



#### Pros and Cons:

- + Qualifies as CatEx under CEQA
- + Temporary shoring NOT required
- + Can be designed to accommodate future widening of Marsh Road
- Slower construction (longer traffic detour duration) than the precast option
- Numerous closely spaced wall drains required (located between each soldier pile)
- Moderate tree trimming required to accommodate construction of soldier piles along Marsh Road
- Significant equipment staging along Marsh Road

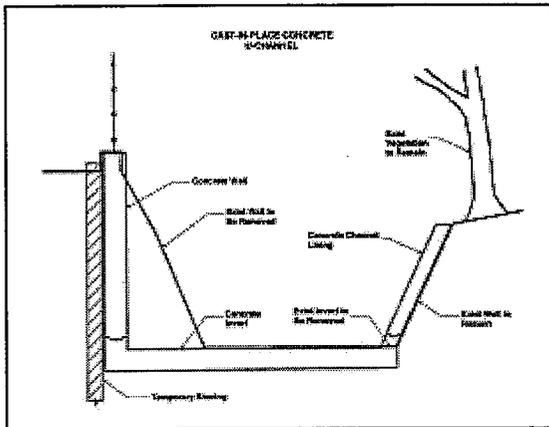
### Option 2: Concrete U-Frame Channel

This option consists of replacing the existing trapezoidal channel with either a cast-in-place or precast concrete U-Frame Channel. Each sub-option will be presented separately:

#### Option 2A: Cast-in-Place Concrete U-Channel:

This alternative uses standard cast-in-place construction techniques to replace the existing channel with a cast-in-place, reinforced concrete U-frame channel. The west (left) wall would be replaced with a vertical concrete wall located roughly in line with the existing curb/fence line. A cast-in-place channel lining constructed over the existing battered wall is proposed along the east (right) bank and an integral cast-in-place concrete invert slab is proposed between the two walls. By casting the new wall over the old wall, slope stability and tree impacts associated with removal of the wall are eliminated. The concrete invert slab serves as both the bottom of the channel and the foundation for the bank retaining walls.

Type Selection Memorandum  
Marsh Road Channel Repair Rehabilitation

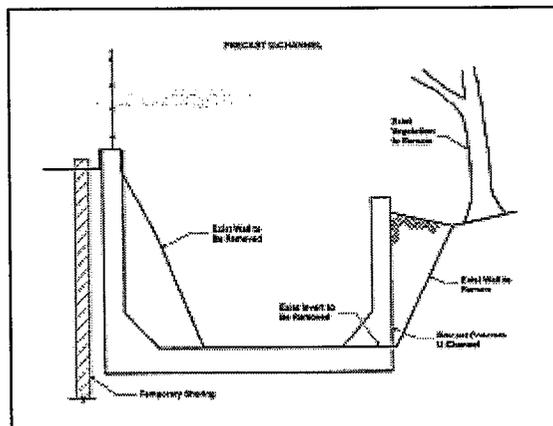


Pros and Cons:

- + Qualifies as CatEx under CEQA
- + Minimal impact to existing east bank trees/vegetation
- + Can be designed to accommodate future widening of Marsh Road
- + Majority of construction performed within the channel limits (minimal equipment staging on Marsh Road)
- Slower construction (longer traffic detour duration) than precast option
- Temporary shoring required to facilitate existing wall removal and in-channel construction

Option 2B: Precast Concrete U-Channel:

This alternative utilizes precast construction techniques to significantly reduce the construction time and corresponding duration of inconvenience to the local residents. This channel replacement option utilizes precast U-channel sections consisting of a concrete invert supporting a pair of vertical walls. Custom precast designs will be required for this option; however fabrication and transport of the sections should not be problematic since many precast suppliers already manufacture and supply 3 sided box culvert and bridge sections of roughly similar size. Due to variations in bank height and channel width along the length of the channel, each precast channel unit will likely need to be custom cast. Special precast sections or cast-in-place transitions would be required at the ends of the channel where they conform to the existing box culverts at Middlefield Road and Fair Oaks Avenue. Temporary shoring would be required along the edge of Marsh Road to maintain the roadway, facilitate removal of the existing west wall and allow sufficient working room for placement of the precast units.



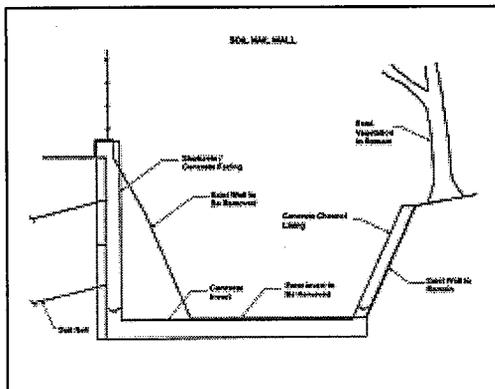
Pros and Cons:

- + Qualifies as CatEx under CEQA
- + Faster construction (shorter traffic detour duration) than cast-in-place options
- + Can be designed to accommodate future widening of Marsh Road
- Temporary shoring required to facilitate existing wall removal and erection of precast units
- Significant tree trimming required to accommodate erection of precast units from Marsh Road
- Significant equipment staging along Marsh Road

### Option 3: Soil Nail Wall

This wall type finds common use in locations where top down construction is desirable. This wall type consists of a vertical or battered concrete/shotcrete wall that is “nailed” into the existing slope utilizing threaded steel bars that are drilled and grouted into the existing soil to stabilize the soil and use the retained soil mass to resist soil overturning forces on the wall. This wall type was used in the 2006/2007 emergency repair of roughly 40-feet of existing west (left) wall.

This structure type is best suited for the west (left) wall of the channel adjacent to Marsh Road where sufficient Town right-of-way exists to accommodate the long soil nails and where soil nail impacts to the existing trees can be avoided. This option eliminates the existing west (left) wall batter which provides additional hydraulic capacity which will allow the east (right) bank to consist of a trapezoidal channel lining cast over the existing channel wall. By casting the new wall over the old wall, slope stability and tree impacts associated with removal of the wall are eliminated. An integral cast-in-place concrete invert slab is proposed. The concrete invert slab serves as both the bottom of the channel and the foundation for the east (right) bank channel lining.



#### Pros and Cons:

- + Qualifies as CatEx under CEQA
- + Temporary shoring NOT required
- + Minimal impact to existing east bank trees/vegetation
- + Can be designed to accommodate future widening of Marsh Road
- + Majority of construction performed within the channel limits (minimal equipment staging on Marsh Road)
- Slightly slower construction (longer traffic detour duration) than the precast option

### 3. Design Criteria

The retaining wall design will be based on the provisions in *AASHTO LRFD Bridge Design Specifications, 4<sup>th</sup> Edition* and *Caltrans Amendments, preface dated Dec 2008* and the current edition of the *Caltrans Trenching and Shoring Manual*.

Design loads shall be in conformance with the design codes and project specific geotechnical recommendations and the following three design cases are considered:

- Case 1: Service Load Case
- Case 2: Temporary Construction Load Case
- Case 3: Seismic Load Case

#### **4. Foundation Recommendations**

Eight geotechnical borings were drilled by URS Corporation in 2006/2007 along Marsh Road adjacent to the Atherton Channel. Available boring data indicates that the project site is generally underlain at the surface by very stiff clayey soils with much of these materials being highly plastic. At about 10 to 11 feet below the surface of Marsh Road, the predominately very stiff clayey soils become much softer and weaker. These medium stiff clays extend to the bottom of the borings, 30 feet below the roadway surface. Groundwater depth is anticipated to vary over the length of the project with groundwater expected at roughly 17 feet below the surface of Marsh Road near Middlefield Road and tapering to 12 feet below the roadway surface near Fair Oaks Avenue. The project site is not located within a zone of required investigation for liquefaction hazards.

Based on the field information available, the soil movements that have contributed to the existing bank failures are generally being caused by the following two processes:

- Soil creep in the highly plastic very stiff upper clay layer which is subject to significant volume changes with variations in moisture content
- Slow motion slope failure or creep caused by the weak soils in the softer medium stiff lower clay layer

Due to the close proximity of Marsh Road to the west (left) bank of the channel, the west (left) wall will be subject to traffic surcharge and vibration loading. The east (right) wall is not subject to these forces. As a result, design of the east (right) wall using “active” soil pressure and design of the west (left) wall using “at-rest” soil pressures has been recommended. Refer to Attachment F: Geotechnical Investigation Memorandum for additional geotechnical information/ recommendations.

Geotechnically, all three proposed replacement options are considered suitable. However, since the channel distress is being affected in part by creep in the weak soils just below the bottom of channel, it is recommended that the temporary shoring required for construction of Option 2A: Cast-in-Place Concrete U-Channel and Option 2B: Precast Concrete U-Channel be left-in-place permanently.

#### **5. Shoring Considerations**

Temporary shoring is not required for either Option 1: Soldier Pile Wall or Option 3: Soil Nail Wall since they both utilize top down construction techniques. Temporary shoring would be required for the Option 2A: Cast-in-Place Concrete U-Channel and Option 2B: Precast Concrete U-Channel since both options require the use of bottom-up construction methods. The Geotechnical Engineer has recommended that the temporary shoring remain in place at the completion of the project.

## **6. Construction Operations and Impacts**

Primary construction access to the channel invert will be via the existing maintenance access gates at the existing box culvert near Fair Oaks Avenue. A limited number of vehicles or small equipment can be staged adjacent to the maintenance access gates without impacting traffic along Marsh Road. Personnel access will be via a ladder and equipment and materials will need to be lowered by a crane. Alternative access can be provided from the top of bank along the shoulder of Marsh Road. However, traffic handling measures will need to be implemented during any access provided from the shoulder of Marsh Road.

Contractor lay down areas are very limited along the residential corridor of the project. Limited space is available at the north end of the channel at the triangular area adjacent to the maintenance access gates at the existing box culvert near Fair Oaks Avenue. Small equipment and materials can be stored/ staged from within the 8-foot wide channel as Contractor operations allow. Any large equipment or materials may need to be staged off site and transported to the site as Contractor operations require. Any off-site lay down facilities will need to be secured by the Contractor.

Dewatering of the project site will be required. Channel dewatering measures are anticipated to consist of small cofferdams located within the existing box culverts at Middlefield Road and Fair Oaks Avenue. Any retained channel flows will need to be temporarily diverted into piping and pumped from the Middlefield Road box culvert to the Fair Oaks Avenue box culvert. Temporary piping is anticipated to be located at the top of the existing east bank as existing trees allow to minimize conflicts with the proposed construction operations.

Existing fencing along the top of bank of the existing channel will be removed and replaced as part of the project. The Contractor shall provide temporary fencing/railing during channel wall replacement construction for the safety of the public.

Anticipated Contractor construction operations will vary based on each proposed alternative and are summarized below (See Attachment D: Working Day Schedule for additional information):

**Option 1: Soldier Pile Wall:** The primary construction operations are anticipated to include drilling, setting and backfilling steel soldier piles in drilled holes along the west (left) wall; excavation and demolition of the west (left) wall including installation of lagging; demolition of the existing concrete invert slab; construction of the concrete invert slab; construction of the concrete/shotcrete facing at the west (left) wall; construction of the concrete/shotcrete facing at the east (right) wall; and installation of fencing/railing along the top of the west (left) wall. The construction of the steel soldier piling, setting of the lagging, and erection of fencing/railing along the top of the west (left) wall will occur from within the existing Marsh Road travelled way. All other primary construction operations can likely be performed from within the existing channel limits. Preliminary construction duration is estimated on the order of 190 total working days with construction in or around the channel for roughly 140 of those days.

Option 2A: Concrete U-Frame Channel: The primary construction operations are anticipated to include installing temporary shoring adjacent to the west (left) wall; excavation and demolition of the west (left) wall; demolition of the existing concrete invert slab; construction of the concrete invert slab; construction of the concrete /shotcrete west (left) wall; construction of the concrete/shotcrete facing at the east (right) wall; and installation of fencing/railing along the top of the west (left) wall. The construction of the temporary shoring and erection of fencing/railing along the top of the west (left) wall will occur from within the existing Marsh Road travelled way. All other primary construction operations can likely be performed from within the existing channel limits. Preliminary construction duration is estimated on the order of 170 total working days with construction in or around the channel for roughly 130 of those days.

Option 2B: Precast Concrete U-Channel: The primary construction operations are anticipated to include installing temporary shoring adjacent to the west (left) wall; excavation and demolition of the west (left) wall; demolition of the existing concrete invert slab; setting precast concrete channel units; constructing cast-in-place concrete conforms between the precast channel units and the existing box culverts; backfilling of the channel walls; and installation of fencing/railing along the top of the west (left) wall. The construction of the temporary shoring, setting of precast channel units, backfilling the channel, and erection of fencing/railing along the top of the west (left) wall will occur from within the existing Marsh Road travelled way. All other primary construction operations can likely be performed from within the existing channel limits. Preliminary construction duration is estimated on the order of 130 total working days with construction in or around the channel for roughly 90 of those days.

Option 3: Soil Nail Wall: The primary construction operations are anticipated to include excavation, installation of soil nails, and construction of the initial shotcrete layer along the west (left) wall; testing of soils nails; demolition of the existing concrete invert slab; construction of the concrete invert slab; construction of the concrete/shotcrete facing at the west (left) wall; construction of the concrete/shotcrete facing at the east (right) wall; and installation of fencing/railing along the top of the west (left) wall. The erection of fencing/railing along the top of the west (left) wall will occur from within the existing Marsh Road travelled way. All other primary construction operations can likely be performed from within the existing channel limits. Preliminary construction duration is estimated on the order of 190 total working days with construction in or around the channel for roughly 140 of those days.

## **7. Hydraulics/Hydrology**

The Atherton Channel is an open trapezoidal channel comprised primarily of battered stone and mortar walls with a cast-in-place concrete invert slab. The Atherton Channel is roughly 1800 feet long and is bounded at the upstream end by an existing box culvert at Middlefield Road and at the downstream end by an existing box culvert near Fair Oaks Avenue.



The depth of the existing Atherton Channel decreases from upstream to downstream. The channel capacity also decreases from upstream to downstream. Likewise, the existing downstream box culvert near Fair Oaks Avenue has less hydraulic capacity than the upstream box culvert at Middlefield Road. A portion of the Marsh Road street drainage flows into the channel via a series of small diameter drainage inlets/ openings in the west (left) wall.

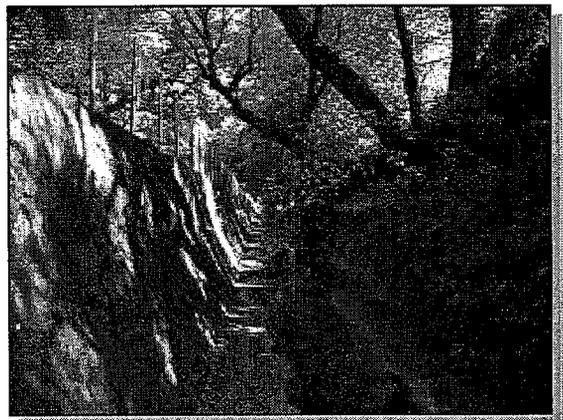
The total tributary drainage area to the project is roughly 4.6 square miles. Preliminary modeling indicates that the existing Atherton Channel has less than a 10-year storm event capacity (which is consistent with observations from the Town) with overtopping of the west bank anticipated to occur between the box culvert at Fair Oaks Avenue and a point roughly 500-feet downstream of the box culvert at Middlefield Road. The existing box culvert at Middlefield Road lack sufficient capacity to convey the 25-year and 100-year flood events and serves as a release point near Watkins Avenue limiting the flows to Atherton Channel.

Preliminary modeling was performed for each of the proposed replacement options. Each replacement option resulted in an increase in channel capacity. However, since the intake capacity of the Fair Oaks Avenue box culvert is less than the channel capacity, replacement of the channel does not increase the overall capacity of the system nor does it increase or decrease the chance of flooding downstream. This is consistent with the scope of the project which is limited to channel rehabilitation/ replacement; it is not intended to provide flood control improvements beyond existing capacity and conditions. Refer to Attachment G: Hydraulic Investigation Memorandum for additional information.

Should flood control improvements be desired to be accommodated into the rehabilitation/ replacement project then the following concepts may wish to be considered to increase the conveyance capacity of the Atherton Channel system: 1. Modify the existing Fair Oaks Avenue box culvert so that it has a more efficient interface with the open channel allowing more water to enter the existing culvert system before backlogging the channel. 2. Construct a supplemental bypass culvert/ pipeline below Marsh Road to divert some of the flow out of the open channel. This would likely require additional flood control capacity improvements downstream of the Atherton Channel.

## **8. Environmental Setting**

The existing channel is an open trapezoidal channel conveying seasonal storm runoff to the Bay. There is an existing bench along the top of the east (right) bank that is heavily vegetated with a wide variety and number of trees, heritage trees, shrubs, flowers and grasses. The west (left) bank abuts against the shoulder of Marsh Road and lacks this vegetated bench. However, the existing stone and mortar channel lining of both banks is heavily worn and cracked and numerous volunteer species of shrubs, flowers and grasses have taken root to various levels of success along the length of the channel. The channel invert is concrete lined and essentially free of vegetation.



Type Selection Memorandum  
Marsh Road Channel Repair Rehabilitation

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The Town of Atherton has indicated that the project qualifies for Categorical Exemption (CatEx) under the California Environmental Quality Act (CEQA). The Design Team concurs with this assessment since the proposed replacement options can be considered replacement in kind (open lined channel).

A preliminary review of readily available biological constraints was performed and is included as Attachment H: Biological Constraints Memorandum. The Atherton Channel lacks naturally occurring habitats due to the existing channel lining, high velocity storm flows, extensive adjacent underground (box culvert) segments, and lack of aquatic vegetation. Based on preliminary findings, it is considered highly unlikely that the channel has any potential for supporting any of the high profile (federally or State-listed) species, such as steelhead, salmon, California red-legged frog or California tiger salamander. A potential for various migratory birds, including the white-tailed kite, a couple species of bats (pallid bat, hoary bat & Yuma myotis) and one terrestrial mammal (San Francisco dusky-footed woodrat) were noted. Further review of the potential for these species will be performed during Phase 2: Final Design & Construction Documents.

A Joint Aquatic Resource Permit Application (JARPA) will be submitted during Phase 2 to the following resource agencies as part of the permitting process for the project: U.S. Army Corps of Engineers (USACE), California Department of Fish and Game (CDFG), U.S. Fish and Wildlife (USFW) and the Regional Water Quality Control Board (RWQCB) as required.

Due to the number of trees and heritage trees (Coast Live Oak) along the east (right) bank, a certified arborist was included as part of the Phase 1 field review to advise on strategies to preserve existing tree health. A total of 25 heritage trees were identified along the east (right) bank within the project limits:

24" Oak at Sta. 0+90	20" Oak at Sta. 5+30	17" Oak at Sta. 7+50	19" Oak at Sta. 9+65
18" Oak at Sta. 1+15	16" Oak at Sta. 5+50	18" Oak at Sta. 7+75	26" Oak at Sta. 9+85
16" Oak at Sta. 2+40	18" Oak at Sta. 5+90	23" Oak at Sta. 8+35	24" Oak at Sta. 10+35
16" Oak at Sta. 3+20	17" Oak at Sta. 6+10	20" Oak at Sta. 8+50	24" Oak at Sta. 11+40
24" Oak at Sta. 3+55	16" Oak at Sta. 6+25	20" Oak at Sta. 8+60	
24" Oak at Sta. 4+35	30" Oak at Sta. 6+65	20" Oak at Sta. 8+70	
24" Oak at Sta. 4+70	26" Oak at Sta. 7+20	22" Oak at Sta. 9+10	

Initial arborist recommendations indicate that all proposed replacement options can be constructed without removing any Town designated heritage trees. (See Attachment I: Tree Memorandum for additional information). However, tree trimming will be required to varying levels depending on which option is selected. Replacement Option 1: Soldier Pile Wall and Option 2B: Precast Concrete U-Channel will require greater levels of tree trimming than Option 2A: Cast-in-Place Concrete U-Channel and Option 3: Soil Nail Wall due to the required use of sizable drilling equipment and cranes to erect soldier piles and precast channel units within the limits of the existing tree canopy.

## 9. Utilities

Based upon the site visit with the Town and existing field markings, the following existing utilities were noted: a 24" storm drain line, a gas main, water main, MCI conduits, and overhead lines. Additionally, PG&E and Comcast are likely to have facilities within the project limits. Most existing utilities appear to be contained within the southbound lane of

Marsh Road and are not anticipated to be impacted by this project. Existing utilities will be shown in the construction documents based on available as-built documentation and will be identified to be protected during construction.

## **10. Traffic Handling**

Marsh Road is a major arterial connection between Route 101 and Middlefield Road. Marsh Road has high traffic volumes and serves as a critical link without many alternative routes.

Public transportation is limited through the project limits. SamTrans does not operate public bus service along this stretch of Marsh Road. However SamTrans does operate daily bus service along portions of the likely detour route (based on the 2008 PG&E Detour Plan) including Middlefield Road and Bay Road. Caltrain also operates the Marsh Road Shuttle, a morning and afternoon shuttle, through the project area.

While there is no formal existing bicycle or pedestrian facilities along Marsh Road, the Design Team recognizes that the unpaved shoulder areas likely provide this accommodation and would need to continue to do so during construction.

Traffic handling will be required to maintain service during construction. Traffic handling plans and/or detour plans will be prepared and coordinated with the Town and County during Phase 2: Final Design & Construction Documents.

## **11. Right-of-Way**

Town right-of-way is assumed to include the full width of Marsh Road and the Atherton Channel up to the face of the existing resident property line fences. All permanent and temporary facilities are anticipated to be contained within the existing Town right-of-way limits.

## **12. Hazardous Materials**

Hazardous materials have not been investigated at the site. Minimal disturbance of the existing site is anticipated based on the structure types proposed. No provisions have been included in the project to account for disposal of hazardous materials.

## **13. Fencing/ Railing**

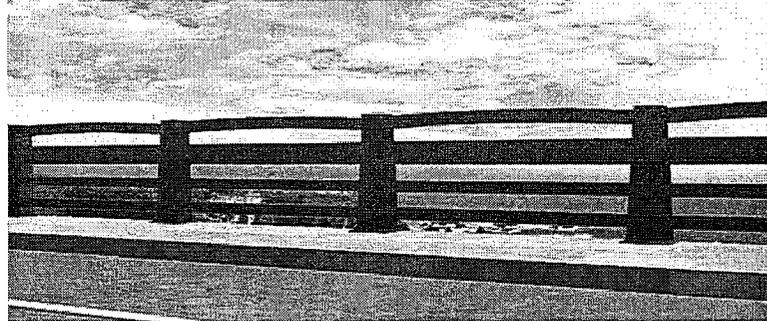
The existing channel adjacent to Marsh Road is topped by a 10" high by 10" wide stone and mortar curb and 4-ft chain link fencing to prevent pedestrian access to the channel and to deter vehicles from straying into the channel. The Town's baseline alternative is to replace the existing curb and fencing in kind when the channel wall is replaced. However, it should be noted that while the existing system is suitable for deterring pedestrian access to the creek channel, the system is not a traffic rated system designed to contain a design level vehicle impact. Posted speed along Marsh Road is 30 mph.

Should the Town desire to increase safety against vehicles entering the creek, traffic rated steel railing alternatives are available. Caltrans has recently developed a series of new traffic rated, see-through steel railing that may be suitable for this application including:

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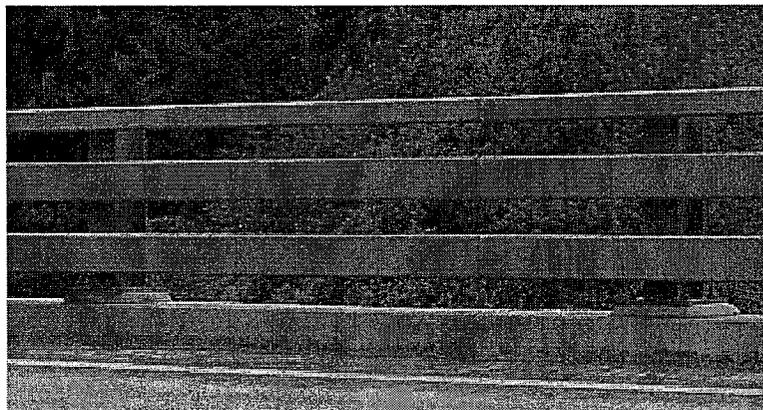
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- California ST-40: This is a test level 2 (TL-2) rated railing suitable for roads with vehicle speeds up to 45 mph. The steel railing is 42 inches high and 22 inches deep and typically is located on a 9" high sidewalk. The railing would need to be modified for application on this project to replace the 9 inch sidewalk with a 9 inch curb. The steel railing consists of tube steel horizontal rails and steel wide flange posts. Impacts on the load rating due to the sidewalk/curb modification are not clear, but vehicular safety is anticipated to increase significantly over the baseline curb & fence system. Caltrans cost information is not available at this time, however costs are anticipated to exceed \$250 per linear foot. Depending on the structural option selected, the 22 inch wide railing system will result in a roughly 1'-0" reduction in available traveled way along Marsh Road.



Looking outside of California, there are several traffic rated steel railing systems in use around the United States that are sanctioned by the Federal Highway Administration with load ratings and details suitable for this project. The Oregon 3-Tube Curb Mount Rail discussed below is the most applicable:

- Oregon 3-Tube: This is a test level 2 (TL-2) rated railing suitable for roads with vehicle speeds up to 45 mph. The railing is 42 inches high and 19.5 inches deep and consists of a low concrete curb and tube steel horizontal rails and steel wide flange posts. FHWA cost information indicates a projected cost of roughly \$80 per linear foot (year of estimate unknown). Depending on structural option selected, the 19.5 inch wide railing system will result in a roughly 9.5" reduction in available traveled way along Marsh Road.

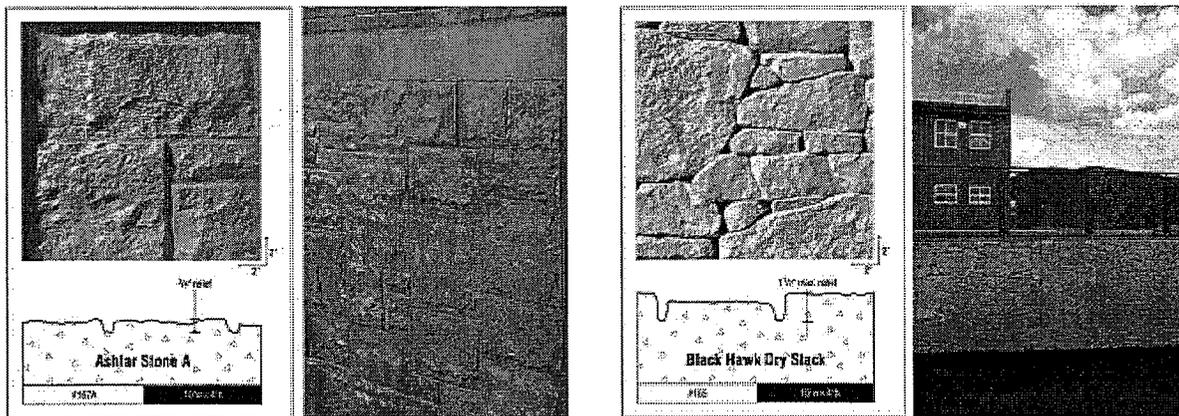


## 14. Aesthetic Treatment

The existing east bank of Atherton Channel is visible from Marsh Road. The existing channel is characterized by a rustic aesthetic dominated by the earth tone stone and mortar retaining walls that blend well with the vegetated eastern slope of the channel.

The replaced and rehabilitated Atherton Channel will consist of a concrete invert channel with cast-in-place concrete or shotcrete retaining walls. For a low cost, small touches and considerations can provide significant dividends in blending the new structure back into the existing channel setting. Aesthetic opportunities include:

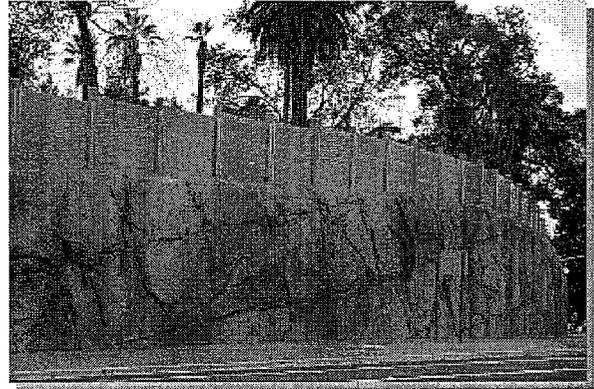
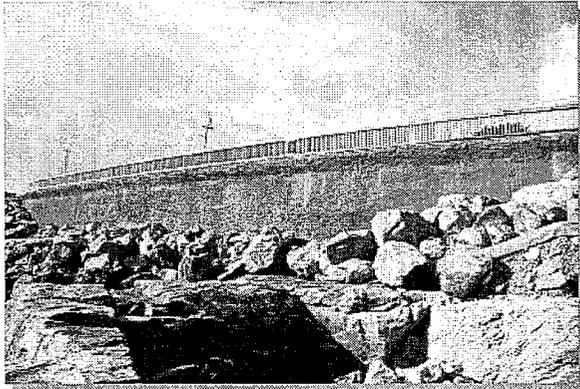
- **Channel Shape:** In general the west wall of the channel is not visible to the public along Marsh Road except near each end at the existing box culverts. A vertical wall is proposed at this location to minimize impacts to Marsh Road and maximize hydraulic capacity.  
The east wall of the channel is visible to the public. Use of a laid back (sloping wall) will provide a more visible wall and softer aesthetic than a vertical wall along the same alignment. The sloped wall will provide a better canvas for the following additional aesthetic features.
- **Surface Textures:** The east wall is an ideal candidate for surface treatment with architectural textures.  
Architectural form liners can be used to create surface textures on either cast-in-place or precast concrete surfaces. Rustic textures such as stone and mortar would be ideal candidates to recreate the existing aesthetic. Numerous off the shelf form liners are available for use, such as those available from Scott Systems (<http://www.scottsystem.com/stone.html>). A few representative samples are shown below:



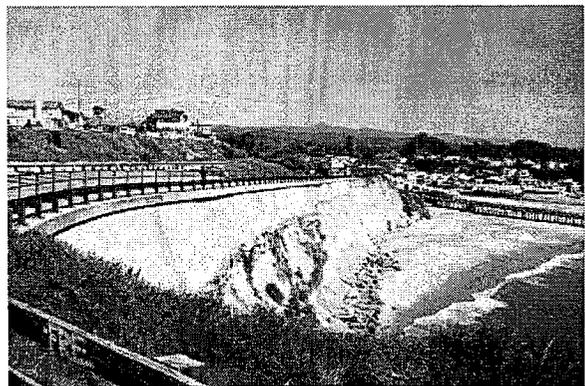
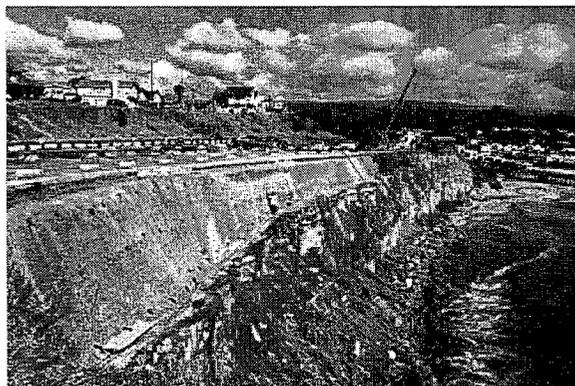
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For shotcrete surfaces, the options are more limited. Standard shotcrete finishes are often used in channel lining projects due to their non-uniform, rough appearance. A standard shotcrete finish comes with the added benefit of no additional cost. Sculpted rock finishes can also be provided for additional cost. The sculpted rock finishes are custom formed by a shotcrete artist as part of the shotcrete operation. Sculpted rock finishes are typically integrally combined with surface staining.



- **Concrete Color:** Coloring of concrete, whether used alone or in conjunction with surface textures, can further soften the concrete surface of the channel. A wide range of concrete colors are readily available on the market, such as those available from Davis Color (<http://www.daviscolors.com/#concrete>). Earth tone colors are deemed the most appropriate for this site. The following sample shows the same wall with and without the final colored shotcrete finish coat:



Depending on the structure type ultimately selected and the Town preferences, appropriate aesthetic treatments will be incorporate into the final design.

## 15. Estimated Costs

Preliminary estimates of probable construction costs were prepared for each Option based on anticipated Contractor construction operations. Refer to Attachment C: Engineer's Estimate for additional information:

Alternate	Project Cost	Channel Length (LF)	Cost/LF Channel
Option 1: Soldier Pile Wall	\$2,892,000	1,805	\$1,602
Option 2A: Cast-in-Place U-Channel	\$2,110,000	1,805	\$1,169
Option 2B: Precast U-Channel	\$2,392,000	1,805	\$1,325
Option 3: Soil Nail Wall	\$2,104,000	1,805	\$1,166

Above costs are based on past project experience and readily available industry cost data at time of report preparation. Estimated costs include structural items of work only and are limited to baseline aesthetics and chain link fencing. Other non-structural, incidental work items, such as temporary fencing, site restoration, etc, are not included.

Projected additional costs for replacement of the chain link fencing with a steel railing are on the order of \$160,000 to \$590,000 depending on the railing selected.

Projected additional costs for colorizing and texturing the exposed concrete surfaces beyond standard concrete/shotcrete finishes are on the order of \$30,000 to \$300,000 depending on the treatments selected with the lower end cost being indicative of simple concrete coloring of the east wall and the upper end being indicative of more complex combination of texture and color such as a sculpted rock finish applied to both walls

Potential modification of the existing Fair Oaks Avenue Box Culvert head wall is not included in the channel repair project scope of work and therefore conceptual headwall modification cost estimates were not developed or included in the above Type Selection alternative costs.

## 16. Conclusions & Recommendations

Based on the project constraints, as summarized in the Conclusions Matrix below, the recommended alternative consists of Option 3: Soil Nail Wall. This option provides the least anticipated impacts to traffic and trees while also maintaining low anticipated construction costs. Construction duration and potential utility impacts are considered average and the structure will provide improved hydraulic conveyance, durability and public safety over the existing channel. This option only scored less than average on its suitability for accommodating the conceptual future construction of a bypass culvert/ pipeline below Marsh Road.

Aesthetic treatment in the form of standard shotcrete (rough) finish combined with earth tone colored concrete is recommended on all exposed concrete/shotcrete surfaces. The Oregon 3-

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Tube steel railing is recommended along the top of the west (left) wall for improved public safety.

Given the existing channel condition and level of distress of the west (left) wall, and prior emergency repair of that wall in 2008 (see Attachment E: Field Review Memorandum), it is recommended that regular channel inspection and maintenance be performed by the Town until the channel replacement is complete. Activities should include monitoring all significant cracks and bulges in the walls, and patching of all significant voids in the walls and invert slab.

Additionally, the Town may wish to modify the existing head wall at the Fair Oaks Avenue box culvert so that it has a more efficient interface with the open channel allowing more water to enter the existing culvert system before backlogging the channel.

**Conclusions Matrix:**

Issues:	Options:	Option 1:	Option 2: U-Channel		Option 3:
		Soldier Pile Wall	2A: Cast-In-Place	2B: Precast	Soil Nail Wall
Construction Costs		2	4	3	4
Construction Duration		3	3	5	3
Traffic Impacts		3	3	2	5
Tree Impacts		3	3	1	5
Utility Impacts		3	3	2	3
Hydraulic Conveyance		4	4	3	4
Future Culvert		3	3	3	1
Durability & Maintenance		4	3	2	4
Public Safety		4	4	4	4
	<b>Overall Rating</b>	<b>29</b>	<b>30</b>	<b>25</b>	<b>33</b>

**Rating System:**

- 5: High Rating
- 4: Above Average Rating
- 3: Average Rating
- 2: Below Average Rating
- 1: Low Rating