



Public Works Department
Engineering Division

MEMORANDUM

Date: November 1, 2006

To: Storm Drain Oversight Committee

From: Joe Teresi (x2129)
Senior Engineer

Subject: Report on capital construction costs and potential impacts on future storm drain capital improvement program

At the April 24, 2006 meeting of the Storm Drain Oversight Committee, staff was asked to return to the Committee no later than October 2006 to report on observed construction costs for storm drain work and potential impacts on the ability to accomplish the full \$17 million storm drain capital improvement program in light of cost patterns. The following is a summary of information and findings on the requested topic:

Gailen-Bibbits Storm Drain Project

Staff received bids for the capital project to extend the Gailen Avenue/Bibbits Drive storm drain outfall to the Adobe Pump Station on August 29, 2006. Three bids were received, the lowest of which was 58% above the engineer's estimate for the work. Staff decided to proceed with the project by transferring \$200,000 from storm drain capital project SD-06101 (Storm Drain System Replacement and Rehabilitation) to supplement the project budget. A contract in the amount of \$758,247 was awarded by the City Council to Casey Construction, Inc. on September 18, 2006. A copy of the staff report for the contract award was transmitted to the members of the Committee.

- Staff does not have a large amount of recent real-life data on storm drain construction costs. This was the first major storm drain project bid by the City since 2002.
- Project construction costs were estimated using the *Means Construction Costs* estimating guide, a nationally-recognized publication used by construction professionals. The guide contains a table of local adjustment factors that are designed to account for local variations in costs. The guide cites an adjustment factor of 127% for construction costs in Palo Alto.
- Staff discussed the project with the contractor, and learned that the relatively high bid amounts could be attributed to the following factors:
 - Cost of deep trench excavation (10 to 16 feet deep), including shoring
 - High risk of substantial trench dewatering costs
 - Limited access to the work site (pipeline is to be constructed along the 20'-wide Adobe Creek maintenance road, with only one point of access at East Meadow Drive)

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- Higher cost of specified pipe material (contract specified centrifugally-spun reinforced concrete pipe in order to control groundwater infiltration – added approximately \$30 per linear foot to bid price)
- Higher fuel costs
- Higher labor costs in Bay Area
- Low bidder's bid price was \$350 per linear foot for 1700 linear feet of storm drain. Material cost from supplier is only \$77 per linear foot (22% of total bid price). After adding in other bid items directly related to the pipe installation, the bid price totals \$410 per linear foot, and the price of materials drops to 19% of the total price.

San Francisquito Creek Storm Water Pump Station

Engineering consultant Schaaf & Wheeler has been retained by the City to design a new storm water pump station at San Francisquito Creek downstream of Highway 101. The design is approximately 50% complete. The consultant recently generated an engineer's opinion of cost for the project at \$5.2 million. The available project budget is only \$4.2 million. The consultant is citing the costs of concrete, steel, and electrical equipment as the primary source of the high construction estimate. Staff is currently pursuing the following actions to reduce the project cost:

- Reviewing the scope of the project to find potential non-essential items to eliminate.
- Investigating the option of making direct pre-purchases of some high-value items (e.g. pumps, electrical generator) to avoid the cost of contractor mark-ups.
- Retaining a contractor to help refine the construction cost estimate and identify potential savings by conducting a value engineering/constructability review of the project.

Review of other construction bids received by the City of Palo Alto in 2006

Staff conducted a review of other construction bids received by the City over the past year. The attached table summarizes recent bids, including the number of bids and a comparison of the low bids to the engineer's cost estimate for each project. The table indicates that other City departments have also experienced relatively high bids over the past year, reflective of the bidding environment that the Committee discussed at its April meeting. Staff from the Santa Clara Valley Water District have noted that their construction costs have risen over 13% over the past year.

Analysis of potential impact of higher construction costs on the implementation of the storm drain capital improvement program

For discussion purposes, staff has used its storm drain funding financial mode to predict the impact of higher construction costs on its ability to complete the set of seven voter-endorsed storm drain capital improvement projects (totaling \$17 million in 2005 dollars) before the increased Storm Drainage Fee sunsets in 12 years (FY 2016-17). Attached are tables depicting five scenarios (pre-storm drain election figures, and four scenarios depicting annual construction cost increases of 3%, 5%, 10%, and 15%, respectively) for discussion by the Committee. These tables demonstrate the marked impact of higher construction costs on staff's ability to implement the proposed capital projects. It should be noted that, based on current inflation figures, it appears likely that staff will be requesting a Storm Drainage Fee rate increase of approximately 4% for FY 2007-08.

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Staff will continue to focus on the following strategies to attempt to minimize the impacts of higher construction costs:

- Conduct additional research on construction prices in order to generate more accurate estimates of future project costs.
- Continue to rely primarily on in-house staff for preparation of construction documents (plans and specifications) in order to avoid consultant fees.
- Strive to bid construction projects during the “off-season” (avoiding the peak summer construction season) in order to generate more competitive bids.
- Modify the scope of work for individual storm drain capital projects in order to match the available funding, if feasible.

I hope that the information provided in this report will generate a productive discussion at our November 1 meeting. While I acknowledge that I do not have all the answers to solve the funding challenges at this time, I hope that during our meeting we will be able to identify some of the key issues on which to focus in the future. If you have any questions or need further information regarding this report, please contact me at (650) 329-2129.

Summary of Major Construction Bids received by City of Palo Alto (2006)

<u>Project Name</u>	<u>Bid Date</u>	<u>Project Low Bid Total</u>	<u>Number of Bidders</u>	<u>% above/below Engineer's Estimate</u>
Children's Library Expansion	Jan-06	\$2,646,000	4	10% above
Arastradero Road Improvements	Mar-06	\$307,779	4	55% below
Sanitary Sewer Rehabilitation	Jun-06	\$6,854,652	2	12% above
Gas Main Replacement	Jun-06	\$1,771,481	4	0.1% below
Street Resurfacing	Jul-06	\$2,282,731	2	26% above
MSC Fueling Station	Aug-06	\$1,278,744	2	27% above
Utility Trench Installation	Aug-06	\$1,290,000	1	Increase
Quarry Electric Substation Expansion	Sep-06	\$1,584,590	3	9% above
Gailen-Bibbits Storm Drain	Aug-06	\$758,247	3	58% above
Main Library Space Reconfiguration	Sep-06	\$269,300	2	22% above

Original Financial Model
Pre-2005 Storm Drain Election

Storm Drain Funding Financial Model

(All dollars expressed in thousands)

	Adopted Budget		Projected w/Rate Incr													
	2005	2006	Year 1 2007	Year 2 2008	Year 3 2009	Year 4 2010	Year 5 2011	Year 6 2012	Year 7 2013	Year 8 2014	Year 9 2015	Year 10 2016	Year 11 2017	Year 12 2018	Year 13 2019	
Capital Improvements																
Storm Drain System Repairs	2,091	2,151	2,210	1,143	1,207	1,270	1,336	1,407	1,476	1,549	1,622	1,698	1,773	1,848	1,923	2,000
Innovative Projects	500	515	530	546	563	580	597	615	633	652	672	692	713	734	755	776
	125	129	133	137	141	145	149	154	158	163	168	173	178	183	188	193
Monthly Fee Per ERU	\$4.25	\$10.00	\$10.30	\$10.61	\$10.93	\$11.26	\$11.59	\$11.94	\$12.30	\$12.67	\$13.05	\$13.44	\$13.84	\$14.26	\$14.68	\$15.10
Capital improvements completed per year:	0	2,091	2,151	2,210	1,143	1,207	1,270	1,336	1,407	1,476	1,549	1,622	1,698	1,773	1,848	1,923
Year-end capital improvement program balance:	17,000	15,419	13,731	11,933	11,148	10,275	9,314	8,257	7,097	5,834	4,459	2,972	1,362	(776)	(1,600)	(2,876)
Assumed annual inflation rate	3.00%															
Total capital improvement program total	17,000															

This is the financial model developed in cooperation with the Blue Ribbon Storm Drain Committee prior to the 2005 storm drain election. In this model, Excel calculated the amount of funds available for capital expenditures based upon the total revenue generated by the Storm Drainage Fees and a set of specified operating expenditures. A basic assumption for this model is that construction costs, operating costs, and revenue all increase uniformly at a rate of 3% annually. The capital expenditures were not tied to a specific project implementation schedule at this point. Based on trial and error, we concluded that we could accomplish approximately \$17 million (2005 dollars) worth of capital improvements in just over 12 years. Note that the capital improvement program balance drops below 0 in Year 13 (FY 2017-18).

Financial Model
with 3% annual
construction
cost increases

Storm Drain Funding Financial Model

(All dollars expressed in thousands)

	Adopted Budget	Projected w/Rate Incr	Year 1 2006	Year 2 2007	Year 3 2008	Year 4 2009	Year 5 2010	Year 6 2011	Year 7 2012	Year 8 2013	Year 9 2014	Year 10 2015	Year 11 2016	Year 12 2017	Year 13 2018
Capital Improvements			1,730	740	4,025	1,400	1,350	1,650	1,600	1,650	1,850	1,800	2,000	2,014	2,432
Storm Drain System Repairs			500	515	530	546	563	580	597	615	633	652	672	692	713
Innovative Projects			125	129	133	137	141	145	149	154	158	163	168	173	178
Monthly Fee Per ERU	\$4.25	\$10.00	\$10.30	\$10.30	\$10.61	\$10.93	\$11.26	\$11.59	\$11.94	\$12.30	\$12.67	\$13.05	\$13.44	\$13.84	\$14.26
Capital improvements completed per year:	0	1,730	740	4,025	1,400	1,350	1,650	1,600	1,650	1,850	1,800	2,000	2,000	2,014	2,432
Year-end capital improvement program balance:	17,000	15,780	15,513	11,954	10,912	9,890	8,536	7,192	5,758	4,081	2,403	475	(1,524)	(4,002)	

Assumed annual inflation rate
Total capital improvement program total

3.00%
17,000

Assumed annual construction cost increase 3.00%

This is the financial model developed after the election to prepare the actual Storm Drainage Fund budget. It was prepared using actual budget figures for revenues and operating expenses. In this model, each year's capital expenditures are tied to a specific scope of work to be accomplished on particular projects in that year. The base assumption of 3% inflation in all costs and revenues remains in place. Since the actual operating expenses were lower than those estimated prior to the storm drain election, more capital work is able to be scheduled each year. As a result, this model shows the \$17 million of capital improvements being nearly completed in Year 11 (FY 2015-16).

**Financial Model
with 5% annual
construction
cost increases**

Storm Drain Funding Financial Model

(All dollars expressed in thousands)

	Adopted Budget		Projected w/Rate Incr													
	2005	2006	Year 1 2007	Year 2 2008	Year 3 2009	Year 4 2010	Year 5 2011	Year 6 2012	Year 7 2013	Year 8 2014	Year 9 2015	Year 10 2016	Year 11 2017	Year 12 2018	Year 13 2019	
Capital Improvements																
Storm Drain System Repairs	1,730	1,730	740	4,025	1,400	1,350	1,650	1,600	1,650	1,650	1,850	1,800	2,000	2,014	2,432	
Innovative Projects	500	125	515	530	546	563	580	597	615	633	652	672	692	713	718	
Monthly Fee Per ERU	\$4.25	\$10.00	\$10.30	\$10.61	\$10.93	\$11.26	\$11.59	\$11.94	\$12.30	\$12.67	\$13.05	\$13.44	\$13.84	\$14.26		
Capital improvements completed per year:	0	1,730	740	4,025	1,400	1,350	1,650	1,600	1,650	1,650	1,850	1,800	2,000	2,014	2,432	
Year-end capital improvement program balance:	17,000	16,120	16,186	12,970	12,219	11,480	10,403	9,324	8,140	6,897	5,232	3,493	1,654	(695)		

Assumed annual inflation rate: 3.00%
 Total capital improvement program total: 17,000

Assumed annual construction cost increase: 5.00%

This financial model depicts what happens if construction costs increase by 5% annually, but revenues and operating costs continue to rise at only 3%. In this instance, less actual construction work would be able to be accomplished each year due to escalating costs. The model shows that in this scenario, there would be a remaining capital program balance of \$1.65 million (2017 dollars) when the increased Storm Drainage Fee sunsets in FY 2016-17.

Financial Model
with 10% annual
construction
cost increases

Storm Drain Funding Financial Model

(All dollars expressed in thousands)

	Adopted Budget	Year 1 2006	Year 2 2007	Year 3 2008	Year 4 2009	Year 5 2010	Year 6 2011	Year 7 2012	Year 8 2013	Year 9 2014	Year 10 2015	Year 11 2016	Year 12 2017	Year 13 2018
Capital Improvements		1,730	740	4,025	1,400	1,350	1,850	1,600	1,650	1,850	1,800	2,000	2,014	2,432
Storm Drain System Repairs		500	515	530	546	563	580	597	615	633	652	672	692	713
Innovative Projects		125	129	133	137	141	145	149	154	158	163	168	173	178
Monthly Fee Per ERU	\$4.25	\$10.00	\$10.30	\$10.61	\$10.93	\$11.26	\$11.59	\$11.94	\$12.30	\$12.67	\$13.05	\$13.44	\$13.84	\$14.26
Capital improvements completed per year:	0	1,730	740	4,025	1,400	1,350	1,650	1,600	1,650	1,850	1,800	2,000	2,014	2,432
Year-end capital improvement program balance:	17,000	16,970	17,927	15,694	15,864	16,100	16,060	16,066	16,023	15,775	15,563	15,108	14,605	13,634
Assumed annual inflation rate				3.00%										
Total capital improvement program total				17,000										
														10.00%

This financial model depicts what happens if construction costs increase by 10% annually, but revenues and operating costs continue to rise at only 3%. In this instance, less actual construction work would be able to be accomplished each year due to escalating costs. The model shows that in this scenario, there would be a remaining capital program balance of \$14.6 million (2017 dollars) (which equates to 16% of the total program) when the increased Storm Drainage Fee sunsets in FY 2016-17.

Financial Model
with 15% annual
construction
cost increases

Storm Drain Funding Financial Model

(All dollars expressed in thousands)

	Adopted Budget	Year 1 2006	Year 2 2007	Year 3 2008	Year 4 2009	Year 5 2010	Year 6 2011	Year 7 2012	Year 8 2013	Year 9 2014	Year 10 2015	Year 11 2016	Year 12 2017	Year 13 2018
Capital Improvements		1,730	740	4,025	1,400	1,350	1,650	1,600	1,650	1,850	1,800	2,000	2,014	2,432
Storm Drain System Repairs		500	515	530	546	563	580	597	615	633	652	672	692	713
Innovative Projects		125	129	133	137	141	145	149	154	158	163	168	173	178
Monthly Fee Per ERU	\$4.25	\$10.00	\$10.30	\$10.61	\$10.93	\$11.26	\$11.59	\$11.94	\$12.30	\$12.67	\$13.05	\$13.44	\$13.84	\$14.26
Capital improvements completed per year:	0	1,730	740	4,025	1,400	1,350	1,650	1,600	1,650	1,850	1,800	2,000	2,014	2,432
Year-end capital improvement program balance:	17,000	17,820	19,763	18,691	20,094	21,758	23,372	25,278	27,420	29,683	32,335	35,185	38,449	41,785
Assumed annual inflation rate				3.00%										
Total capital improvement program total				17,000						Assumed annual construction cost increase	15.00%			

This financial model depicts what happens if construction costs increase by 15% annually, but revenues and operating costs continue to rise at only 3%. In this instance, the cost of the capital work is increasing faster than the revenue is coming in, resulting in very little actual progress. The model shows that in this scenario, there would be a remaining capital program balance of \$38.4 million (2017 dollars) (which equates to 42% of the total program) when the increased Storm Drainage Fee sunsets in FY 2016-17.