

# 2010 EARTHQUAKE SAFETY AND EMERGENCY RESPONSE BOND



AWSS

FIRE STATIONS

PUBLIC SAFETY

CITY AND COUNTY OF SAN FRANCISCO





# 2010 EARTHQUAKE SAFETY AND EMERGENCY RESPONSE BOND

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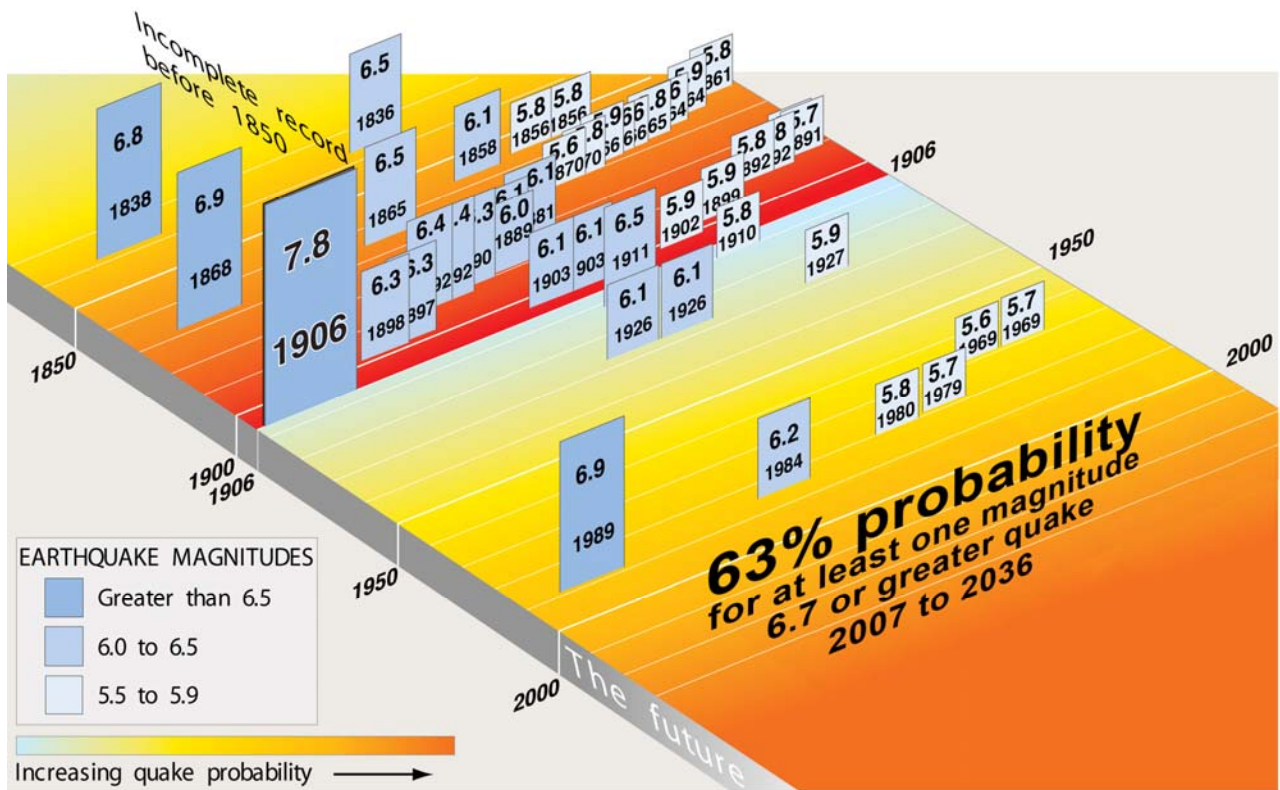


## EXECUTIVE SUMMARY

The City and County of San Francisco is proposing a \$412.3 million Earthquake Safety and Emergency Response (ESER) Bond for the June 2010 Ballot. The purpose of the ESER Bond is to pay for repairs and improvements that will allow San Francisco to more quickly respond to a major earthquake or other disaster.

San Francisco is located in earthquake country. The United States Geological Survey (USGS), states that there is a 63% chance of a 6.7 or greater magnitude earthquake striking the Bay Area - by the year 2036.

### Why Now?



San Francisco Bay Region Earthquake Probability. Source: U.S. Geological survey

In earthquake country, timing and preparation are everything. Planning for tomorrow's emergency, today, will:

- Reduce injuries, deaths, and property damage by providing first responders with equipment and infrastructure they need to safeguard our communities.
- Save money as we address needed repairs and upgrades before inflation makes them more expensive in the future.
- Expedite our recovery after the event, thereby reducing crime, preserving jobs, and ensuring the rapid return of San Francisco in the immediately following weeks and months.



### What Will This Bond Do?

The ESER bond is the result of a citywide assessment of emergency response capital needs. It will:

#### Repair the City's Emergency Firefighting System

Supplementing the City's domestic water system, the Auxiliary Water Supply System (AWSS) was built in the aftermath of the 1906 Great Earthquake and is a network of underground pipes, pump stations, water tanks, and reservoirs that provide water to fight fires. The bond will rehabilitate and upgrade the critical core facilities that make the AWSS functional – two pump stations, two storage tanks, and the primary reservoir atop Twin Peaks.

**TABLE 1: GO Bond Budget**

<b>Projects and Programs</b>	<b>Cost (millions)</b>
AWSS Core Facilities	\$35.0
Critical Firefighting Facilities and Infrastructure	134.3
Public Safety building	243.0
<b>Total</b>	<b>\$412.3</b>

#### Seismically Upgrade Neighborhood Fire Stations, Pipes and Cisterns

The ESER Bond Program also provides \$134.3 M to fund a program of repairs and improvements to critical firefighting facilities and infrastructure driven by a comprehensive San Francisco Fire Department (SFFD) Capital Improvement Plan (CIP). The CIP will guide the seismic strengthening and rehabilitation of critical firefighting facilities and infrastructure funded by this bond including:

- Rehabilitation and seismic upgrade of selected fire stations
- Construction of additional firefighting cisterns that provide an emergency source of water for firefighting
- Repairs, replacement, and improvements to the most vulnerable components of the AWSS pipe network

#### Ensure Operation of the Police Command Center in Emergencies

The Police Command Center and a district police station will move out of the Hall of Justice and into a seismically safe facility in Mission Bay. The seismically safe Public Safety Building will ensure that police can respond citywide to citizen distress and be able to provide a coordinated response during and after a major earthquake.

#### Who Is Proposing This and What Will It Cost Me?

The ten-year Capital Plan is the City's formal commitment to long term, strategic, and fiscally responsible capital planning. The ten-year Capital Plan is annually adopted by the Mayor and Board of Supervisors to prioritize capital needs across all City departments. This bond proposal is the top priority of the current Capital Plan.

The 2010 Earthquake Safety and Emergency Response Bond is consistent with the primary financial constraint in the Capital Plan: that this bond program does not result in property tax levels that exceed those in effect in fiscal year 2006. In other words, new ESER bonds will be issued only as the City pays off previous bonds that funded the construction of other City facilities such as neighborhood parks and libraries, Laguna Honda Hospital, San Francisco General Hospital, the Academy of Sciences, and the Asian Art Museum.



## **How Can I Be Sure The Money Will Be Spent Wisely?**

The 2010 ESER Bond Program represents the highest levels of transparency and fiscal accountability, including:

- a. A clear plan to complete a list of specific projects;
- b. A framework for defining and prioritizing projects to improve critical firefighting facilities and infrastructure;
- c. Preparation and periodic updates of a comprehensive ESER Bond Program Financial Plan; and
- d. Public oversight and financial accountability measures as follows:
  1. Publication of bond program status reports and summary information from the ESER Bond Program Financial Plan on a dedicated ESER bond web site, updated monthly by DPW;
  2. Regular reviews by the independent Citizen's General Obligation Bond Oversight Committee (CGOBOC) which is empowered to stop future bond sales should they determine that funds were not spent in accordance with the express will of the voters;
  3. Periodic issuance of bond accountability reports to the Clerk of the Board, the Controller, the Treasurer, the Director of Public Finance, and the Budget Analyst;
  4. Annual public review before the Capital Planning Committee and the Board of Supervisors prior to any expenditures; and
  5. Annual progress updates to the Fire and Police Commissions.







## INTRODUCTION

The City and County of San Francisco is proposing a \$412.3 million Earthquake Safety and Emergency Response (ESER) Bond for the June 2010 Ballot. The purpose of the ESER Bond is to pay for repairs and improvements that will allow San Francisco to more quickly respond to a major earthquake or other disaster.

It's critical to make these upgrades now before another major disaster happens. Responding quickly in an emergency will have a direct impact on how well San Francisco recovers after the next big earthquake, potentially reducing the number of injuries and deaths, as well as speeding the City's economic recovery which can keep San Francisco residents working in the crucial weeks and months immediately after a great earthquake.

San Francisco is located in a region prone to having earthquakes. Unlike, hurricanes and tornadoes; which produce phenomena that allow forecasters to provide us with some short-term advance warning; the actual timing of earthquakes is unpredictable. The best we can do is rely on the United States Geological Survey (USGS), which is able to predict that there is a 63% chance of a 6.7 or greater magnitude earthquake striking the Bay Area at some time in the near future.<sup>1, 2</sup>

The aftermath of both the 1906 and 1989 earthquakes taught San Francisco lessons it has taken to heart. Most of us are familiar with the Great Earthquake of 1906. What you may not know is that the majority of the damage came not from the shaking, but the fires that erupted thereafter. As a result, after 1906, a high pressure dedicated fire fighting system to fight multiple alarm fires was built.

More recently, the 1989 Loma Prieta Earthquake, which took place 60 miles from the City and measured 6.9 on the Richter scale, triggered major fires in the Marina District.

The potential monetary losses following a major earthquake are staggering. A report<sup>3</sup> released by the Applied Technology Council (ATC) estimates building damages from a major earthquake due to shaking and fire at \$16.3 billion to \$37.9 billion in 2005 dollars. Fire damage would account for 20% to 50% of total earthquake damage, or about \$8 billion in losses. If the City's Auxillary Water Supply System fails to perform after an earthquake, the fire damage contribution may increase to as much as 80% of total earthquake losses, as illustrated by the tragedy in 1906. Fire damage of this magnitude would severely impact the economy of the Bay Area and San Francisco's capacity to recover.

### Notes:

- 1 U.S Geological Survey, 2007. *The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2)*; obtained from website: [http://pubs.usgs.gov/of/2007/1437/of2007-1437\\_text.pdf](http://pubs.usgs.gov/of/2007/1437/of2007-1437_text.pdf)
- 2 U.S. Geological Survey, USGS Fact Sheet 2008-3027. *Forecasting California's Earthquakes – What We Can Expect in the Next 30 Years*; obtained from website: <http://pubs.usgs.gov/fs/2008/3027/fs2008-3027.pdf>
- 3 Applied Technology Council (ATC), March 1, 2005. *San Francisco's Earthquake Risk - Report on Potential Earthquake Impacts in San Francisco*; obtained from website: [http://www.pbs.org/newshour/indepth\\_coverage/science/1906quake/atc-report.pdf](http://www.pbs.org/newshour/indepth_coverage/science/1906quake/atc-report.pdf)



## Timing Is Critical:

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Marina District, 1989



When living in earthquake country, “timing” can be the most critical factor for many different reasons:

- Responding quickly in an emergency reduces the number of injuries, deaths, and property damage caused by a great earthquake and fire. A guiding principal of our City’s long history of investment in San Francisco first responders is committing to the quickest possible response.
- Response times have a direct impact on how well San Francisco recovers after the next big earthquake, potentially speeding the City’s economic recovery and preserving the jobs of San Francisco residents in the weeks and months immediately following a great earthquake.
- It’s critical to make these upgrades now before another major disaster happens. When dealing with the structural damage caused by large earthquakes, “an ounce of prevention is worth a pound of cure”.
- The longer we delay making these repairs and improvements, the longer our police and other first responders – and the San Franciscans who depend on them in an emergency – will have their lives at risk.
- Every year that we delay repairs and needed upgrades to our firefighting facilities and infrastructure, and public safety buildings, the cost increases. These buildings and infrastructure must be fixed sooner or later: by acting now, we can improve safety and save local taxpayer dollars.

Although these are uncertain times economically, by repairing backup systems, making seismic upgrades and relocating critical communications systems to new buildings, San Francisco can better ensure it protects its citizens, neighborhoods and businesses in the event of an earthquake that the United States Geological Survey tells us is more likely to happen than not.



## The 2010 Earthquake Safety and Emergency Response Bond will:

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Police and fire response



Firefighters responding to fire

- **Repair and upgrade the Core Facilities of the City's aging back-up emergency water system.** Proceeds from the bond will be allocated toward rehabilitating and upgrading the critical core facilities that make the Auxiliary Water Supply System (AWSS) functional – two pump stations, two storage tanks, and the primary reservoir.
- **Seismically strengthen and rehabilitate critical firefighting facilities and infrastructure including neighborhood fire stations and firefighting cisterns.** Proceeds from the bond will be allocated toward the rehabilitation of fire stations and construction of additional firefighting cisterns that provide a back-up source of water for firefighting, and will determine the critically important repairs and replacement of the most vulnerable components of the AWSS pipe network.
- **Relocate of the Police Headquarters and a district police station from the seismically vulnerable Hall of Justice and construction of a Mission Bay Fire Station.** Proceeds from the bond will be allocated toward the relocation of police facilities from the obsolete and unsafe Hall of Justice at 850 Bryant to a seismically safe facility in Mission Bay. The Public Safety Building will include construction of a new fire station in the Mission Bay neighborhood to accommodate the growing community.

To ensure that our firefighters and police officers have the proper resources to immediately respond after an earthquake, emergency, or major disaster, San Francisco's Capital Planning Committee recommended the Mayor and Board of Supervisors place a \$412.3 million General Obligation Bond that will retrofit and seismically rehabilitate our aging public safety infrastructure for the June 2010 electoral ballot.



## PROJECT AND PROGRAM DESCRIPTIONS

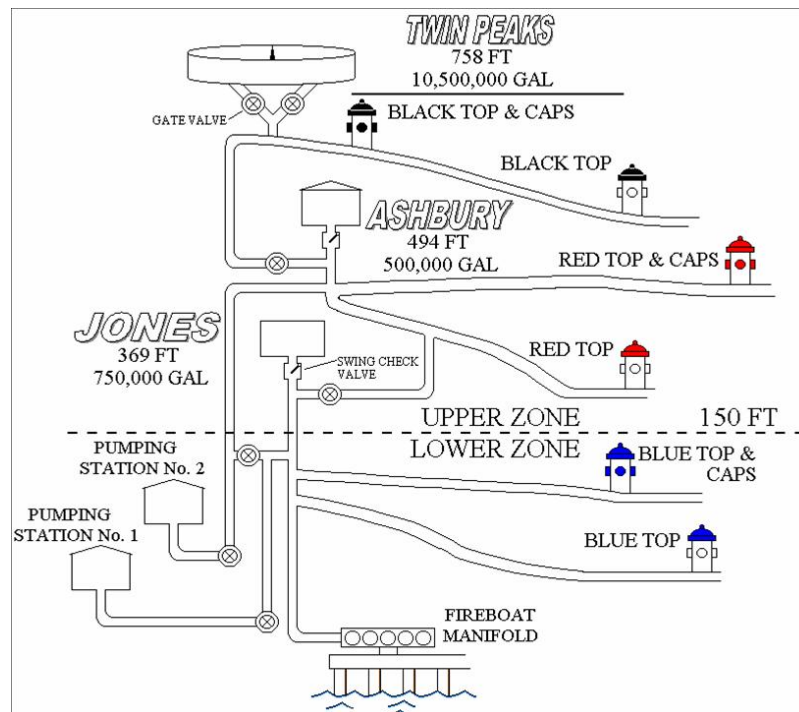
### Auxiliary Water Supply System (AWSS) Core Facilities

**Background:** Following an earthquake, the San Francisco Auxiliary Water Supply System (AWSS) is vital for protecting against the loss of life, as well as the loss of homes and businesses. The AWSS is used throughout the year for the suppression of multiple-alarm fires. It provides an additional layer of fire protection, in addition to the domestic water system, in the event of a major earthquake. The AWSS delivers water at high pressure and includes two pump stations, two storage tanks, one reservoir, and approximately 135 miles of pipes. Additionally, the system includes 52 suction connections along the northeastern waterfront, which allow fire engines to pump water from San Francisco Bay, and two fireboats that supply seawater by pumping into any of the five manifolds connected to the AWSS pipes. The AWSS also includes 1,600 hydrants and 3,828 valves.

**TABLE 2: GO Bond Budget**

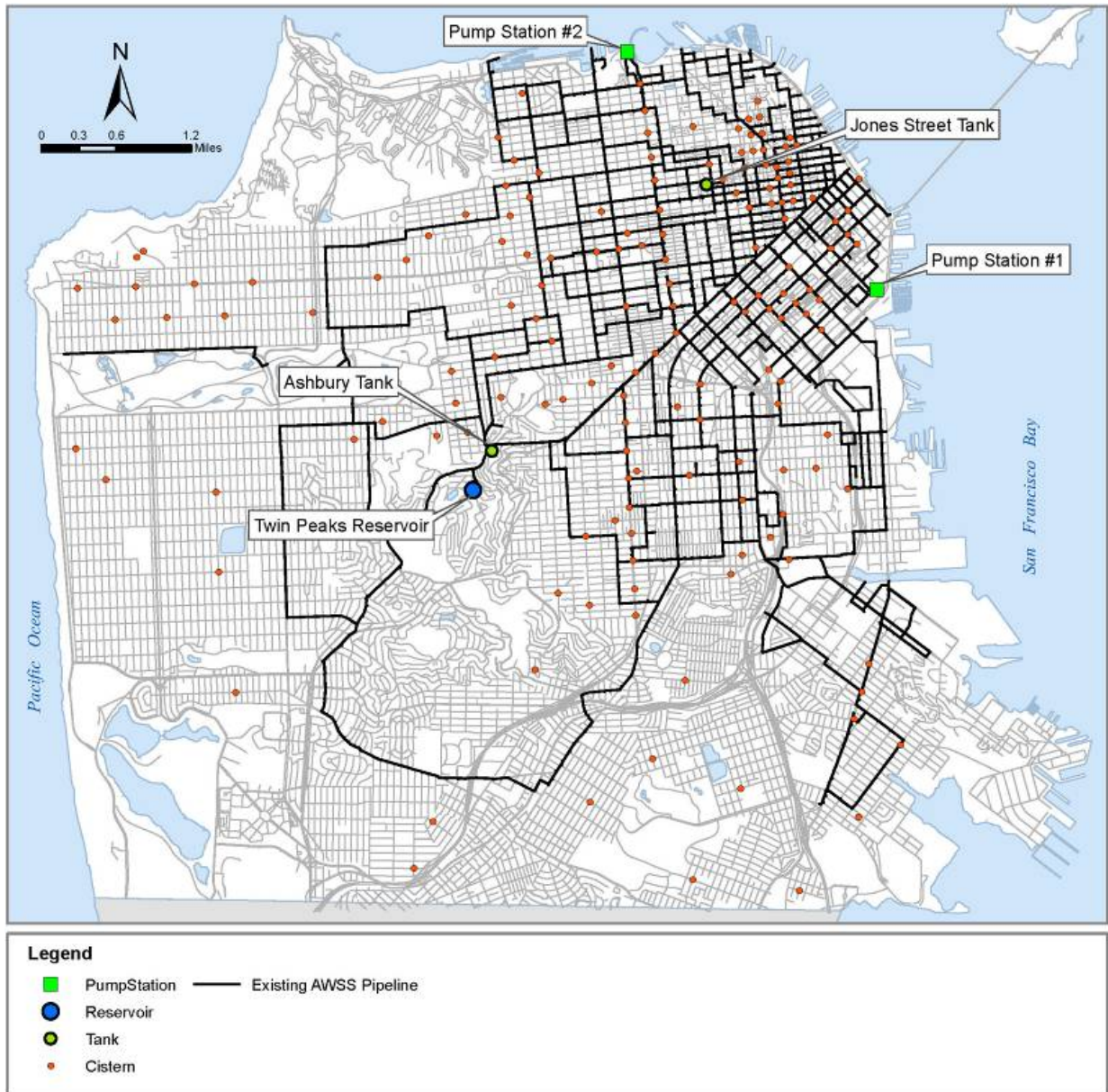
Projects and Programs	Cost (millions)
AWSS Core Facilities	\$35.0
Critical Firefighting Facilities and Infrastructure	134.3
Public Safety Building	243.0
<b>Total</b>	<b>\$412.3</b>

**Project Description:** The Earthquake Safety and Emergency Response Bond will improve and seismically upgrade a set of Auxiliary Water Supply System (AWSS) Core Facilities, two pump stations, two storage tanks, and the primary reservoir.



Schematic diagram of the Auxiliary Water Supply System for Fire Suppression





Existing AWSS System

The objectives of the project are to make seismic and operational improvements to the following five AWSS core facilities to preserve capacity and to ensure a reliable service life:

- Twin Peaks Reservoir
- Ashbury Heights Tank
- Jones Street Tank
- Pump Station No. 1
- Pump Station No. 2

**Schedule:** The construction projects will proceed in a phased sequence to maintain sufficient capacity to respond to emergencies at all times. The final project, Jones Street Tank, will be completed in December 2016.



<b>Budget*:</b>	<b>Millions</b>
Twin Peaks Reservoir	\$4.3
Ashbury Heights Tank	\$5.9
Jones Street Tank	\$6.5
Pump Station No. 1	\$3.5
Pump Station No. 2	\$14.2
Bond Oversight and Financial Accountability	\$0.1
Bond Issuance	\$0.5
<b>Total AWSS Core Facilities</b>	<b>\$35.0</b>

\* The project budgets provide for estimated construction cost, including contingencies for (1) identification, during design, of necessary increases in the scope of work, (2) escalation for inflation, and (3) construction change orders. The construction cost estimates were prepared by cost estimating experts based on conceptual project designs for each facility.







## TWIN PEAKS RESERVOIR



The reservoir just below the summit of Twin Peaks



Cracked reservoir pilaster

**Location:** Marview Way and Fairview Court

**Background:** The Twin Peaks Reservoir was constructed in 1911 on Twin Peaks at an elevation of 759 feet. The reservoir is accessed by a driveway at the intersection of Marview Way and Fairview Court and can hold approximately 11 million gallons of water.

**Project Description:** The proposed improvements at the Twin Peaks Reservoir will require it to be completely drained of water in order to inspect and repair the concrete dividing wall and liner. The proposed improvements are as follows:

- **Reservoir Liner**—At the time of construction, the reservoir was excavated from solid rock and lined with six-inch thick reinforced concrete. Preliminary site reconnaissance determined that some areas have aggressive plant growth through the concrete liner. The invasive plants will be removed, and the liner will be repaired.
- **Reservoir Structure**—The reinforced concrete wall and its foundation, which divides the reservoir into two equal bays, have been found to be potentially vulnerable to failure in an earthquake. The reinforced concrete wall and foundation will be seismically improved.
- **Gate Valves and Inlet Valves**—The valves date back to when the facility was originally constructed and are at the end of their useful service life. Improvements include replacing valves, piping connections, restraints, and supports with modern equipment that resists seismic movement. Further, the inlet valves controlling the flow of water from the reservoir of the San Francisco Public Utilities Commission will be replaced with motorized valves for an automatic refill of the Twin Peaks Reservoir.

- Walls and Fences—The concrete curb and pillars around the perimeter reservoir are cracked, scaled, and deteriorated. The work scope includes repairing the damaged concrete curb and pillars. The rusted iron fence and chain-link fence on top of the reservoir walls will be replaced with a new iron fence, similar in design to the original. The chain-link fence on top of the iron fence will be removed and a taller, more secure chain-link fence will be installed to enhance security at the facility.

<b>Milestone</b>	<b>Schedule</b>
Start Design	January 2011
Start Construction	July 2012
Complete Construction	December 2013

<b>Budget<sup>1</sup></b>	<b>Millions</b>
Construction	\$3.1
Project Control <sup>2</sup>	1.2
<b>Capital Improvement Total</b>	<b>\$4.3</b>

Notes:

1 Budgets throughout this report are escalated to estimated midpoint of construction and rounded up to the nearest \$100K.

2 "Project Control", throughout this report, consists of activities such as planning, design, project management, construction management, compliance with regulatory agency requirements, and all other "soft costs" necessary to assure high quality of design and construction, as well as timely completion of the project.



## ASHBURY HEIGHTS TANK



Ahsbury Heights Tank



Gate Valve House Interior

**Location:** 1234 Clayton Street

**Background:** This tank and associated gate control house were constructed in 1911. The Ashbury Heights Tank is at an elevation of 494 feet at 1234 Clayton Street, immediately east of the intersection of Carmel Street and Twin Peaks Boulevard. The Ashbury Heights Tank supplies water to the upper zone of the AWSS and can hold approximately 500,000 gallons of water.

### Project Description:

- **Water Tank**—The seismic improvements include replacing the tank and its foundation. The new tank will be of similar size and storage capacity but constructed of reinforced concrete instead of steel. The new roof of the tank will have the same slope as the existing roof. All of the pipes, fittings, supports, restraints, and joints, connecting the tank to the gate valve house will be replaced.
- **Retaining Wall**—There is a 12-foot retaining wall along the rear end of the property. The proposed seismic improvements include removing a nearby tree and strengthening the retaining wall.
- **Water Pumps**—The two water pumps and associated motors inside the gate valve house will be replaced with more efficient electric pumps.

<b>Milestone</b>	<b>Schedule</b>
Start Design	January 2011
Start Construction - After Twin Peaks Reservoir is Complete	January 2014
Complete Construction	June 2015

<b>Budget</b>	<b>Millions</b>
Construction	\$4.3
Project Control	1.6
<b>Capital Improvement Total</b>	<b>\$5.9</b>



## JONES STREET TANK



Jones Street Tank

**Location:** 1239 Jones Street, between Clay and Sacramento Streets.

**Background:** The Jones Street Tank and associated gate control house were constructed in 1908. The tank sits at an elevation of 369 feet and supplies the lower zone of the AWSS. The tank can hold approximately 750,000 gallons of water.

### Project Description:

- **Water Tank**—Seismic retrofit to the water tank includes anchoring the foundation base to prevent the tank from sliding or rocking. The wood framing supporting the terra-cotta tile roof over the tank is in poor condition. The improvements will include replacing the tile roof and wood framing and wood cupola structure at the top of the tank.
- **Piping from the Water Tank to the Gate Valve House**—The two main effluent pipes from the water tank to the gate valves in the gate valve house, including fittings, supports, restraints, and joints, are vulnerable to rupture in an earthquake. The proposed improvements will replace the two pipes including seismic ball joints.
- **Valve House Gate Valves and Pipes**—The improvements include installing electric actuators on the gate valves for autonomic operation and reconditioning the check valves.
- **Replacement of Piping from Valve House to Street**—The four 18-inch pipelines running from the gate control house to the AWSS pipes on Jones Street are at the end of their useful service life and are vulnerable to rupture in an earthquake. The improvements include replacing the four pipelines which extend from the valve house up to and including the first joint after the pipes bend under Jones Street. Pipeline replacement would include fittings, restraints, and supports. The work will also require a section of the building foundation below grade to be removed and replaced to facilitate the work.
- **Valve House**—The flat concrete roof of the gate control house is in poor condition and leaks. The flat roof would be reroofed and the lead glass in all the skylights would be replaced to prevent shattering in an earthquake.
- **Facility Rehabilitation** – In conjunction with the seismic improvements the facility will be rehabilitated to extend its service life. Rehabilitation work will include replacement of malfunctioning drain lines, replacement of the hoist and addition of motorized controls to the bridge crane, safety and accessibility improvements to the entrance door of the gate control house.



<b>Milestone</b>	<b>Schedule</b>
Start Design	January 2011
Start Construction - After Ashbury Heights Tank is Complete	July 2015
Complete Construction	December 2016

<b>Budget</b>	<b>Millions</b>
Construction	\$4.7
Project Control	1.8
<b>Capital Improvement Total</b>	<b>\$6.5</b>



## PUMP STATION NO. 1



Pump Station No. 1



Pump No. 1

**Location:** 698 Second Street, at the corner of Second and Townsend Streets

**Background:** Constructed in 1911, Pump Station No. 1 supplies seawater to the lower zone of the AWSS in the event of failure of the entire freshwater system and is also capable of supplying water to the upper zone.

**Project Description:** The proposed improvements to Pump Station No. 1 include improvements and upgrades to extend the life and usability of the existing equipment.

- Pump Controllers—Replace the current controller to allow for individual automatic and manual control of each pump.
- Mechanical Ventilation—A new ventilation system will provide filtered air into the basement where the pumps and diesel engines are located.

Milestone	Schedule
Start Design	January 2011
Start Construction	March 2012
Complete Construction	March 2013

Budget	Millions
Construction	\$2.5
Project Control	1.0
<b>Capital Improvement Total</b>	<b>\$3.5</b>







## PUMP STATION NO. 2



Pump Station No. 1



Steam Turbines Electric Generator

**Location:** Aquatic Park

**Background:** Pump Station No. 2 is at the northern-most end of Van Ness Avenue, on the east side of Black Point in the Golden Gate National Recreation Area. The pump station was constructed in 1912. Pump Station No. 2 pumps seawater from the bay to the AWSS. Like Pump Station No. 1, Pump Station No. 2 is capable of supplying seawater at high pressure to the AWSS in the event that the freshwater system fails.

**Project Description:** The building's foundation, walls, and roof need substantial seismic strengthening in order for the facility to remain functioning in the event of a major earthquake. The rear portion of the steam boilers, which were abandoned in place when the pumps were converted to diesel fuel, will be removed, allowing the space to be used for ADA-accessible crew quarters and allowing access to the west wall for structural reinforcing. The existing steam boiler façades will be structurally reinforced and preserved in place. All the functioning mechanical equipment including the pumps, diesel drives, valves, and piping, will be removed and replaced with modern equipment.

- **Building Structure**— The columns in the rear retaining wall on the west side of the building and all four walls will be reinforced. The foundations of the nearby water tanks will be improved.
- **Pump Systems**—All of the mechanical pump systems will be removed and replaced and at least one pump would be preserved in the building. The piping for these pumps will be replaced up to the expansion joint.
- **Pipelines**— An excavation pit is required at the north and south ends of the building to access the pipes that supply the Ashbury Heights and Jones Street tanks, respectively.
- **Mechanical Heating Ventilation and Air Conditioning System**—The building will be outfitted with a new heating, ventilation, and air-conditioning system to provide ventilation and to limit humidity and minimize condensation and corrosion.

- Fire Sprinklers—A wet-sprinkler fire suppression system will be installed to protect the facility.
- Offices and Attendant Quarters—A fully ADA-accessible office and crew quarters will be provided.
- Building Reroofing—The flat concrete roof is in poor condition and leaks. The bond will build a new roof . Further, the lead glass in all the skylights will be replaced with Plexiglas or polycarbonate glass to prevent shattering in the event of an earthquake.
- Electrical Transformer—The electrical system will be upgraded to conform to the building code and the electrical transformer at the southeastern corner of the building’s exterior will be relocated to an underground vault.
- Garage—The existing garage will be demolished and rebuilt in a manner appropriate to its location in the Golden Gate National Recreation Area. The garage is anticipated to house two AWSS Pump Station maintenance and support vehicles along with equipment and supplies for the Portable Water Supply System (PWSS). The rebuilt garage will preserve the existing foundation, floor slab, and retaining walls to the extent that they are found to be sufficient for the installation of new construction.

<b>Milestone</b>	<b>Schedule</b>
Start Design	January 2011
Start Construction - After Pump Station No. 1 is Complete	April 2013
Complete Construction	April 2015

<b>Budget</b>	<b>Millions</b>
Construction	\$10.3
Project Control	3.9
<b>Capital Improvement Total</b>	<b>\$14.2</b>



## CRITICAL FIREFIGHTING FACILITIES AND INFRASTRUCTURE



AWSS fire hydrants

A portion of the bond, \$134.3 Million, is allocated to the construction, acquisition, improvement, retrofitting and completion of critical firefighting facilities and infrastructure for earthquake safety and emergency response not otherwise defined as site-specific projects, including neighborhood fire stations, cisterns, and AWSS pipes and tunnels. The use of this portion of bond proceeds will be subject to approval of the Board of Supervisors upon completion of planning and any required environmental review under California Environmental Quality Act (CEQA).

The functional goals and general parameters of the work to be financed by this portion of the bond were developed in consultation with the San Francisco Fire Department and reflect the department's highest priorities for improvements to firefighting facilities and infrastructure.

### **San Francisco Fire Department Capital Improvement Plan:**

Implementation of this portion of the bond program will commence with development of a comprehensive SFFD Capital Improvement Plan (CIP) for construction, acquisition, improvement, and retrofitting of the Fire Department's firefighting facilities and infrastructure, including fire stations, cisterns, and AWSS. The SFFD CIP will be prepared by Department of Public Works (DPW) working in close collaboration with Fire Department staff. DPW will conduct additional assessments of existing conditions and determine, with the Fire Department, the most beneficial and cost effective repairs or improvements. During the course of planning, specific projects at specific sites will become the subject of environmental review.

Upon review and acceptance by the Fire Department, and recommendation by the Fire Commission, the SFFD CIP will be presented by the Fire Department and DPW to the City's Capital Planning Committee for inclusion in the City's 10-Year Capital Plan, which the committee annually recommends for adoption by the Board of Supervisors.





## NEIGHBORHOOD FIRE STATIONS



Damage of mechanical equipment at fire station



Ceiling damage at fire station

**Background:** There are 42 fire stations in San Francisco located strategically in every neighborhood. Hundreds of firefighters inhabit these fire stations every day. While the stations may look updated on the outside, many of the fire stations have structural, seismic, and other deficiencies. Some may not be operational after a large earthquake or disaster; threatening the ability of the firefighters to respond to an emergency.

### Project Description:

This bond will renovate or replace fire stations to provide improved safety and a healthy work environment for the firefighters. Neighborhood fire stations will be selected for repair, rehabilitation, improvement, or replacement based on the scoring criteria described below.

Preliminary assessment of the neighborhood fire stations indicate that the sum of all existing deficiencies at the neighborhood fire stations would require a budget exceeding \$400 Million to correct, significantly more funds than are available for such purposes in this bond. Therefore, additional detailed planning is required to develop a Fire Stations Capital Improvements Plan that will focus the expenditures of this bond towards the most beneficial and cost effective immediate rehabilitation and/or improvement projects.

### Fire Stations Capital Improvement Plan:

A detailed Fire Stations Capital Improvements Plan (CIP) will be developed in consultation with the San Francisco Fire Department. A key consideration of the Fire Stations CIP will be identification of work that can be performed without impairing station operations, and determination of an acceptable sequence of temporary facility deactivations to expedite safe execution of the work while maintaining sufficient Fire Department capacity to respond to emergencies. Another key consideration will be the ratio of planned project benefits to project cost. Candidate projects will be assigned point scores reflecting their capacity to achieve the types of improvements listed below.

### Fire Station Improvements

1. Seismic safety improvements
2. Emergency systems improvements, including power generators
3. Americans with Disabilities Act requirements
4. Boiler safety and facility heating improvements



5. Indoor air quality improvements
6. Water protection improvements

Project scores will also take into consideration the probability and consequences of potential health and property losses in the adjacent neighborhood, and the cost of the improvement projects. Projects with higher scores will be assigned higher priority in the development of the Fire Stations CIP. Depending on the scope of the recommended and approved projects, this bond program may complete improvements to about 50% of the 42 neighborhood fire stations.

### Schedule

The development of the project schedules for the Fire Stations CIP will be guided by the high priority that must be given to preservation of public safety. The number of stations that can be temporarily deactivated for construction at any one time will be limited. Depending on the scope of the recommended and approved projects, this limitation may result in a CIP that requires up to 7 years to complete construction at about 20 stations.

<b>Milestone</b>	<b>Schedule</b>
Start Planning and Design	January 2011
Start Construction	January 2012
Complete Construction	July 2019

<b>Budget<sup>1</sup></b>	<b>Millions</b>
Construction	\$46.0
Project Control <sup>2</sup>	18.0
Bond Oversight and Accountability	0.2
Bond Issuance	0.9
<b>Total</b>	<b>\$65.1</b>

Notes:

1 Depending on the scope of the recommended and approved projects, the budgets for sub-programs of the Critical Firefighting Facilities and Infrastructure may vary within the overall allocation of \$134.3 Million.

2 The allocation to Construction and Project Control, in advance of actually defining the projects, reflects the City's experience in delivering relatively small-scale construction projects that entail rehabilitation and improvement of existing fire stations, most of which are older than 50 years and located in dense residential and commercial neighborhoods.



## FIREFIGHTING CISTERNS



Cistern access



Exposed cistern perimeter brick

**Background:** One of the multiple layers of fire protection maintained by the San Francisco Fire Department is a collection of underground cisterns. The cisterns provide a supplemental source of water for fire suppression in the event that the domestic water system and/or the Auxiliary Water Supply System are unavailable or prove insufficient to fight a fire. The cisterns are stand-alone reservoirs that provide a highly reliable but limited quantity of water that may prove to be a crucial resource in the event of an earthquake that produces significant ground motion.

About 177 cisterns, mostly located in the northeast quadrant of the City, are currently maintained by the Fire Department. The cisterns are not connected to the AWSS piping system and water is pumped into or out of the cisterns using engine pumps.

The cisterns installed in the late 1800's and early 1900s were constructed of brick, while a majority of the later construction is of reinforced concrete. The storage volumes of the cisterns range from approximately 75,000 gallons to 200,000 gallons.

### Project Description:

This bond proposal will construct new cisterns or retrofit existing cisterns to increase the earthquake safety response capacity of the Fire Department. Cisterns will be selected for retrofit or construction based on the scoring criteria described below. The scoring criteria recognize that the density of existing cisterns is significantly lower in the southern and western quadrants of the City.

In 1986, the Fire Department conducted an environmental review of a program for construction of new cisterns that included proposed locations for 95 cisterns. 23 cisterns were constructed under that program leaving a balance of 72 locations that are potential sites for this bond program, once the projects for this program are defined. The cost of installing 72 new cisterns is estimated to be about \$80 Million, about twice the amount of funds that are available for such purposes in this bond. Therefore, additional detailed planning is required to develop a Fire Department Cisterns Capital Improvements Plan that will focus the expenditures of this bond towards the most beneficial and cost effective locations for construction of new cisterns and retrofit of existing cisterns.

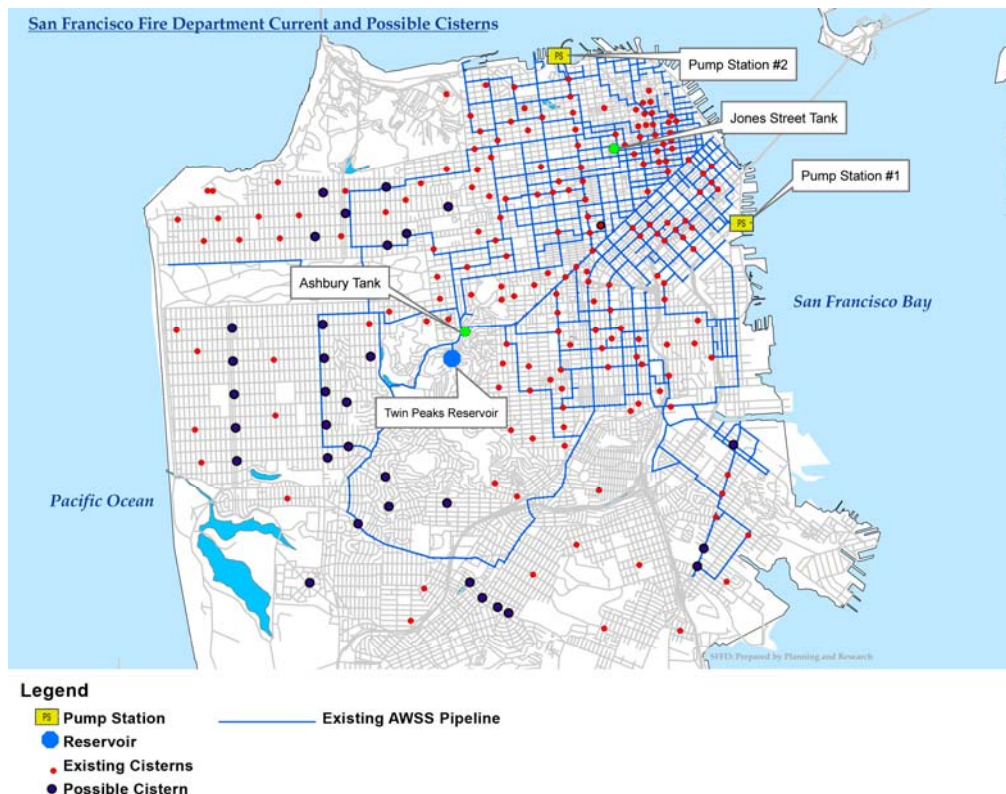
## Firefighting Cisterns Capital Improvement Plan:

A detailed Firefighting Cisterns Capital Improvements Plan (CIP) will be developed in consultation with the San Francisco Fire Department. Different neighborhoods are constructed with different building densities and they present different risks of fire losses. Detailed planning must be completed to assess the risk of fire losses in various neighborhoods and analyze the current deployment of cistern resources. The Fire Department will also assess the benefits of enhancing fire protection capacity along key fire break corridors to limit the spread of fire in the event of a major fire catastrophe.

The Firefighting Cisterns CIP will quantify the extent of the apparent deficit of cistern resources in the southern and western quadrants of the City and develop an equitable response. Candidate projects will be assigned point scores reflecting the fire protection benefits of each project relative to the costs. Projects with higher scores will be assigned higher priority in the development of the Firefighting Cisterns CIP. Depending on the scope of the projects recommended for funding approval by the Board of Supervisors, this bond program may complete about 30-35 new cisterns. Scoring criteria will include:

1. Population and property at risk of fire loss
2. Distance to existing water storage resources
3. Opportunities for enhancement of multiple layers of fire protection along fire break corridors
4. Extent of deterioration and risk of loss of existing cistern capacity

The map below shows the potential locations of a program to construct 32 new cisterns subject to such a program being recommended in the Fire Department Cisterns CIP and, upon completion of environmental review, approval of funding by the Board of Supervisors.





<b>Milestone</b>	<b>Schedule</b>
Start Planning and Design	January 2011
Start Construction	July 2012
Complete Construction	January 2016

<b>Budget<sup>1</sup></b>	<b>Millions</b>
Construction	\$26.0
Project Control <sup>2</sup>	10.0
Bond Oversight and Accountability	0.1
Bond Issuance	0.5
<b>Total</b>	<b>\$36.6</b>

Notes:

1 Depending on the scope of the recommended and approved projects, the budgets for sub-programs of the Critical Firefighting Facilities and Infrastructure may vary within the overall allocation of \$134.3 Million.

2. The allocation to Construction and Project Control, in advance of actually defining the projects, reflects the City's experience in delivering underground infrastructure projects located in the public right-of-way in dense residential and commercial neighborhoods.





## FIREFIGHTING PIPES AND TUNNELS



AWSS pipes along sea wall to bayside fireboat



AWSS corroded pipe

**Background:** As noted in the description of the Auxiliary Water Supply System (AWSS) Core Facilities, the AWSS is used for the suppression of multiple-alarm fires. It was originally constructed in 1913, shortly after the 1906 earthquake and provides an additional layer of fire protection, in addition to the domestic water system, in the event of a major earthquake.

In January 2009, the engineering firm AECOM/Metcalf & Eddy completed an AWSS Study in which they noted:

### ***Condition of Buried Pipelines***

While the age of the AWSS pipelines are known, their physical condition is relatively unknown. Pipe conditions can vary widely because of the many factors that can affect pipeline deterioration, such as soil settlement, corrosive soil chemistry, exposure to bay water tidal fluctuations and stray currents. Pipes in some areas may be in good condition despite their age, while others may be substantially deteriorated. The amount of AWSS pipeline that needs replacement and the time frame is best determined through a comprehensive condition assessment and replacement program.

The AECOM/Metcalf & Eddy AWSS Study described the existing pipes:

### ***Distribution Mains***

The existing AWSS pipeline network consists of 135 miles of 8 to 20-inch cast and ductile iron pipe. Pipes installed prior to 1960s consist of special extra-heavy pit cast iron bell and spigot pipe. The joints are special double-beaded lead construction. Double-spigot pipe with cast sleeves are used in specific areas of poor soil and artificial fill. Restraining rods and longitudinal bolts are installed across joints at all turns and other points of stress to resist joint pullout.

Beginning in 1960's, standard specification was changed to ductile iron pipe with pushon rubber-gasket joints. Ductile iron was selected for its improved strength, ductility and durability. Rubber gasket joints are easier to install and provide improved leakage protection and joint flexibility. Bolts and tie rods are now specified in stainless steel to provide high corrosion resistance.

About 77 miles of original AWSS pipeline was constructed in 1913 and may be nearing the end of its useful life.

The firefighting pipes and tunnels of the AWSS system includes a 1,100 foot long concrete intake tunnel that runs under Townsend Street serving Pump Station No. 1, and a concrete intake tunnel approximately 160 feet long and five feet in diameter, serving Pump Station No. 2.

### **Project Description:**

This bond will retrofit, improve, or replace existing firefighting pipes and tunnels to increase the earthquake safety response capacity of the Fire Department. Specific pipe and tunnel projects will be defined based on the scoring criteria described below.

The AECOM/Metcalf & Eddy AWSS Study indicated that the cost of installing AWSS pipe is significantly higher than that for typical domestic water pipe. Each mile of 20-inch AWSS pipe costs \$19 million (2008 dollars) to install, vs. approximately \$3.7 million for 20-inch domestic water pipe. The City does not currently have much information regarding the physical condition of the pipes and tunnels, but if 50% of 77 miles of original pipes and tunnels that are nearly 100 years old require replacement within the next 50 years, the AECOM/Metcalf & Eddy unit costs would indicate that a 50-year pipe and tunnel replacement program would cost \$20 Million to \$30 Million **per year** for 50 years, assuming that average escalation for inflation is 5% per year.

The AECOM/Metcalf & Eddy AWSS Study described the potential for optimizing the AWSS system design to lower ongoing costs to rehabilitate and maintain the system:

The annual expenditures for pipe replacement are directly related to the amount of aging pipe in the system. The current pipe network configuration requires a significant annual expenditure to maintain the system in a state of good repair. Optimizing the pipe network would reduce the long-term expenditures and has other benefits as well.

The current pipe network was configured for conditions at the time of original construction of the AWSS in 1908. Optimizing the pipe network involves evaluating today's firefighting needs and refining the layout and density of piping with the objective of reducing maintenance costs and improving reliability and flexibility.

For example, the density of piping in the Downtown area is approximately 110 feet of pipe per acre. By comparison, the density of piping in the North Beach, Pacific Heights and Marina Districts is approximately 50 – 70 feet of pipe per acre. Optimization in the Downtown area would include evaluating whether the firefighting needs could be met with a backbone system. A backbone system consists of a streamlined network of larger diameter pipes spaced farther apart. The above noted annual cost for a pipe and tunnel replacement program and the cost of AWSS optimization significantly exceed the amount of funds that are available for such purposes in this bond. Therefore, additional detailed planning is required to develop a Firefighting Pipes and Tunnels Capital Improvements Plan that will focus the expenditures of this bond towards the most beneficial, cost effective, and urgent projects to retrofit, improve or replace portions of the fire fighting pipes and tunnels.



## Firefighting Pipes and Tunnels Capital Improvement Plan:

A detailed Firefighting Pipes and Tunnels Capital Improvements Plan (CIP) will be developed in consultation with the San Francisco Fire Department. San Francisco's neighborhoods are constructed with different building densities and they present different risks of fire losses. Detailed planning must be completed to assess the risk of fire losses in various neighborhoods and analyze the current capacity of the AWSS pipe network to protect each neighborhood in the event of major earthquake or catastrophic fire.

The Firefighting Pipes and Tunnels CIP will establish a planning framework for optimization and expansion of the AWSS to guide prudent and urgent retrofit, improvement, or replacement projects. Candidate projects will be assigned point scores reflecting the community-wide fire protection benefits of each project relative to the costs. Projects with higher scores will be assigned higher priority in the development of the Firefighting Pipes and Tunnels CIP. Scoring criteria will include:

1. Results of pipe condition investigations
2. Results of leak investigations
3. Population and property at risk of fire loss
4. Opportunities for enhancement of multiple layers of fire protection along fire break corridors

<b>Milestone</b>	<b>Schedule</b>
Start Planning and Design	January 2011
Start Construction	July 2012
Complete Construction	October 2016

<b>Budget<sup>1</sup></b>	<b>Millions</b>
Construction	\$23.0
Project Control <sup>2</sup>	9.0
Bond Oversight and Accountability	0.1
Bond Issuance	0.5
<b>Total</b>	<b>\$32.6</b>

### Notes:

1. Depending on the scope of the recommended and approved projects, the budgets for sub-programs of the Critical Firefighting Facilities and Infrastructure may vary within the overall allocation of \$134.3Million.
2. The allocation to Construction and Project Control, in advance of actually defining the projects, reflects the City's experience in delivering underground infrastructure projects located in the public right-of-way in dense residential and commercial neighborhoods.





## PUBLIC SAFETY BUILDING



Public Safety Building concept massing – view from southwest

**Location:** Block 8 in the Mission Bay South Redevelopment Area. The block is bounded by Mission Rock, Third, and China Basin Streets.

**Background:** The functionality of the entire police department in the event of a major catastrophe relies on the ability of the police leadership to promptly and properly coordinate public safety services in the city. The District Station plays an equally critical role in providing responsive public safety to residents of San Francisco in a timely manner. This station includes those working the front line. Services they provide include being the first to arrive at a crime scene, maintaining the peace during difficult situations, assisting in the investigation of criminal activity; providing support to other first responders including the Fire Department and the Medical Examiner.

Both the Police Headquarters and the Southern District Police station are located at 850 Bryant also known as the Hall of Justice. This facility is over 50 years old and does not meet current seismic codes and requirements. In the event of a major earthquake, this building is not expected to be operational.

**Project Description:** The project of approximately 320,200 square feet would include, a police station, a police command center headquarters, a fire station, and adaptive reuse of Fire Station # 30 to provide for multi-use by the fire and police departments and the community. Historic resource consultants have determined that the existing fire station is eligible for the National Register of Historic Places. Consistent with the Mission Bay SEIR Addendum No. 7, Mitigation Measures, Item D.02, this facility will be retained and reused in a manner that preserves its historic integrity. The other components of the project will be designed to be respectful of the historic integrity of the existing fire station.



The following is an estimate of the size of the proposed project:

<b>Facility</b>	<b>Size (gross square feet)</b>
Police Headquarters	130,500
Police Southern Station	27,000
Fire Station	22,000
Fire Station # 30	6,200
Parking for 245 Vehicles	134,500
<b>Total</b>	<b>320,200</b>

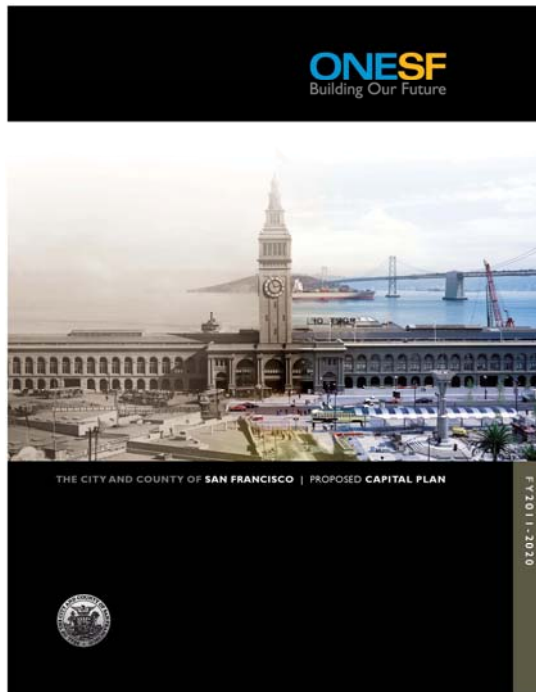
<b>Milestone</b>	<b>Schedule</b>
Start Construction Documents	January 2011
Start Construction	July 2012
Complete Construction	July 2014
Move In	October 2014

<b>Budget</b>	<b>Millions</b>
Construction	\$187.5
Project Control	55.4
Bond Oversight and Accountability	0.7
Bond Issuance	3.3
Subtotal	246.9
Mission Bay Development Agreement Reimbursement	(3.9)
<b>Total Bond Funding</b>	<b>\$243.0</b>





## TEN YEAR CAPITAL PLAN



Proposed Capital Plan 2011-2020

### **A Fiscally Responsible Solution to the City's Critical Capital Needs**

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The 2010 Earthquake Safety and Emergency Response Bond proposal is the most recent product of the City's formal commitment to long term, strategic, and fiscally responsible capital planning. Adopted through legislation by the Mayor and Board of Supervisors in 2005, the Capital Planning Committee was created to guide and prioritize capital needs citywide. The Ten Year Capital Plan (the Plan) is developed by the Capital Planning Committee and adopted annually by the Board of Supervisors prior to adoption of the annual City budget. The Plan prioritizes critical capital projects that impact the public's safety and well being; places a strong emphasis on accountability and transparency; and most importantly, demonstrates the highest levels of fiscal restraint and responsibility. Since its inception, the top priorities of the Capital Plan have been the seismic improvement of San Francisco General Hospital, which voters approved in November 2008, and the seismic improvement of our public safety facilities which this bond addresses.

The City has invested significant General Fund dollars into the repair and rehabilitation of our capital assets over the years. However, the City cannot rely on annual funds alone to address these critical needs. Where annual funds are not adequate to pay the costs of major capital improvements, the Plan recommends using one of two sources of long-term debt financing: General Obligation (G.O.) bonds backed by property taxes upon approval by voters and General Fund debt programs backed by the City's General Fund upon approval by the Board of Supervisors and the Mayor. Both sources are appropriate means of funding capital improvements as they spread the cost of these facilities over their long useful lives and across the generations of San Franciscans that will reap their benefits.

Despite a large backlog of capital infrastructure needs, the Capital Plan has adopted strict financial constraints on the use of long-term debt financing so as to not place an increased burden on



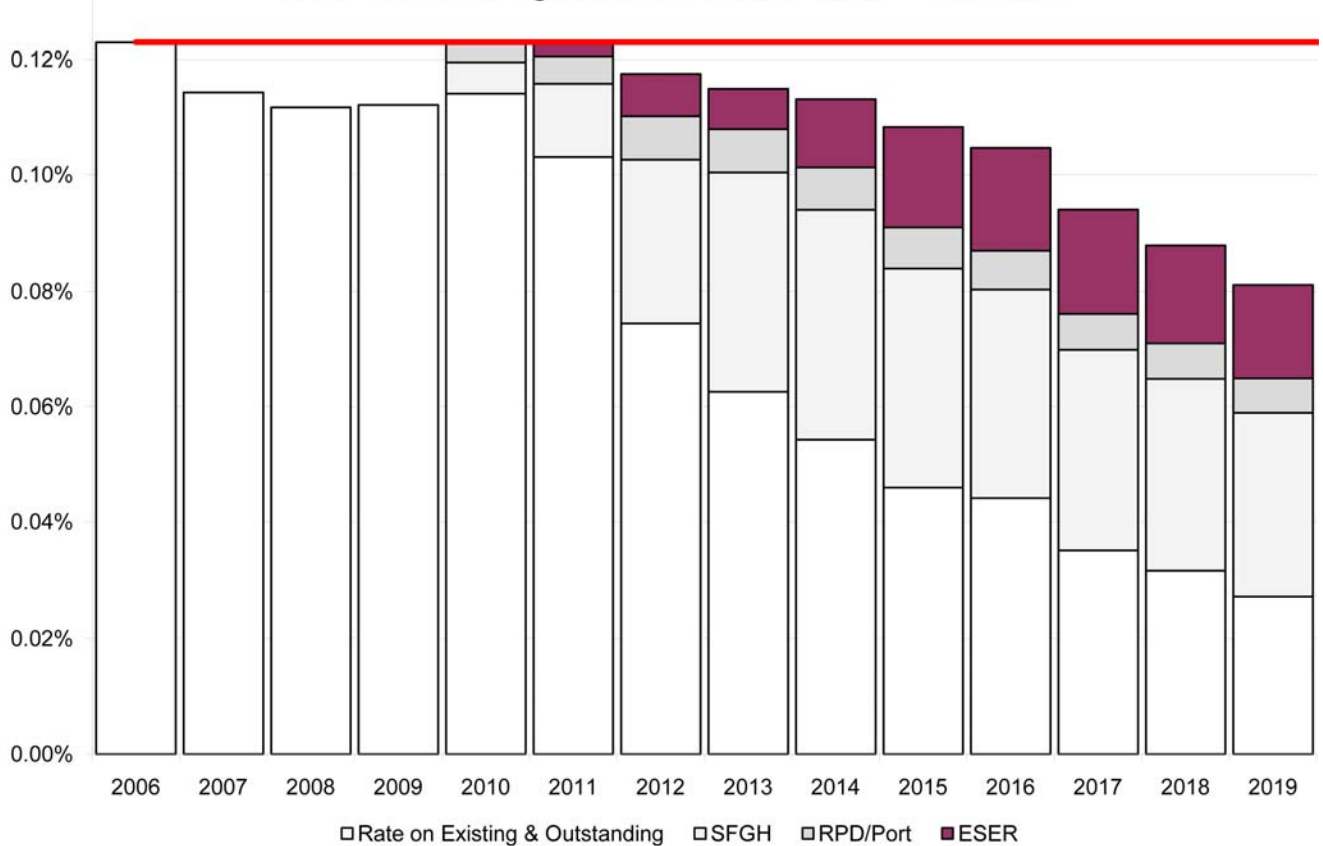
future generations. Voter-approved G.O. bonds proposed by the Capital Plan are only proposed as the City retires existing debt from prior bonds. As we pay off our obligations for other facilities such as branch libraries, neighborhood parks, Academy of Sciences, and hospitals, the City can initiate new capital projects without increasing property tax rates.

The Earthquake Safety and Emergency Response G.O. Bond, therefore, **will not increase property tax rates** beyond their fiscal year 2006 levels. This is shown graphically in Chart 1 below.

For more information on the City's Capital Plan, please visit <http://www.sfgov.org/cpp>.

**CHART 1: Maintaining The Tax Rate - Debt capacity available to fund capital projects including Earthquake Safety and Emergency Response Bond**

**CCSF General Obligation Bond Debt Service, FY 2006-2019**



## ACCOUNTABILITY MEASURES

The 2010 ESER Bond Program provides the following accountability measures, described in more detail below.

- Specific project budgets
- Framework for defining and prioritizing projects to improve critical firefighting facilities and infrastructure
- Comprehensive financial plan maintained by DPW
- Public oversight and financial accountability reviews

### Specific Project Budgets

The 2010 ESER Bond Program consists of “Specific Projects” with the following project budgets:

<b>AWSS Core Facilities</b>	
Twin Peaks Reservoir	\$4.3 M
Ashbury Heights Tank	\$5.9 M
Jones Street Tank	\$6.5 M
Pump Station No. 1	\$3.5 M
Pump Station No. 2	\$14.2 M
AWSS Core Facility bond oversight, accountability, and bond issuance	\$0.6 M
<b>Total</b>	<b>\$35.0 M</b>
Public Safety Building	\$243.0 M

### Framework For Defining and Prioritizing Projects

The 2010 ESER Bond Program also provides a framework for defining and prioritizing projects for the funds allocated to Critical Firefighting Facilities and Infrastructure (CFFI).

<b>CFFI provides funding for:</b>	
Neighborhood Fire Stations	\$65.1 M
Firefighting Cisterns	\$36.6 M
Firefighting Pipes and Tunnels	\$32.6 M
<b>Total CFFI</b>	<b>\$134.3 M</b>



The Fire Department (SFFD) and Department of Public Works (DPW) will prepare a comprehensive SFFD Capital Improvement Plan (CIP) for each type of critical firefighting facilities and infrastructure, including fire stations, cisterns, and the Auxiliary Water Supply System (AWSS). The objective scoring criteria that are listed in “Project and Program Descriptions” will guide the development of the SFFD CIP.

The City’s Capital Planning Committee annually recommends a 10-Year Capital Plan for adoption by the Board of Supervisors. SFFD and DPW will present the SFFD Capital Improvement Plan to the City’s Capital Planning Committee for inclusion in the City’s 10-Year Capital Plan.

In the event that the Specific Projects, listed above, require less funding than budgeted, the surplus funds may be allocated to CFFI to complete additional projects of CFFI in accordance with the SFFD CIP.

### **Comprehensive Financial Plan**

DPW will maintain a comprehensive ESER Bond Program Financial Plan. DPW will prepare and update the ESER Bond Program Financial Plan in coordination with the two user departments and two departments responsible for facilities management:

- ESER Bond User Departments
  - Fire Department
  - Police Department
- ESER Bond Facilities Management Departments
  - GSA Real Estate Division
  - Public Utilities Commission

DPW will periodically revise the ESER Bond Program Financial Plan as it may become necessary to fulfill the goals of the bond program. For example, upon adoption of the SFFD CIP by the Board of Supervisors, DPW will update the ESER Bond Financial Plan to identify specific projects and project budgets to complete the Critical Firefighting Facilities and Infrastructure (CFFI) portion of the bond program.

### **Public Oversight and Financial Accountability Reviews**

Public oversight and financial accountability measures include:

- **Web Site:** Publication of bond program status reports and summary information from the ESER Bond Program Financial Plan on a dedicated ESER bond program web site, updated monthly by DPW.
- **CGOBOC Audits:** The City’s Citizen General Obligation Bond Oversight Committee (CGOBOC) is responsible for auditing the implementation of the ESER bond per the Administrative Code (Section 5.30 to 5.36). CGOBOC will hold public hearings and collect standard progress reports on the bond. In addition, one-tenth of one percent (0.1%) of total bond proceeds will fund CGOBOC financial audit activities. Should CGOBOC determine that any funds were not spent in accordance with the express will of the voters, they are empowered to deny subsequent issuances of bond funds.



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- **Bond Accountability Reports:** Per the Administrative Code (Section 2.70 to 2.74), 60 days prior to the issuance of any portion of the bond authority, the Department of Public Works will submit the ESER Bond Program Financial Plan, in the form of a bond accountability report, to the Clerk of the Board, the Controller, the Treasurer, the Director of Public Finance, and the Budget Analyst describing the current status and description of each proposed project and whether it conforms to the express will of the voters.
- **Annual Reviews:** The bond will be subject to annual public reviews before the Capital Planning Committee and Board of Supervisors. The Department of Public Works will also provide, at a minimum, annual updates on the progress of ESER projects and activities and the ESER Bond Program Financial Plan to the Fire Commission and Police Commission.

