



- Board of Directors
Engineering and Operations Committee

12/13/2011 Board Meeting

7-4

Subject

Appropriate \$200,000; and authorize seismic assessment of the San Gabriel Tower (Approp. 15441)

Description

This action authorizes detailed seismic investigations of the San Gabriel Tower. This structure on the Upper Feeder has been in operation for 75 years. It serves a critical function in the delivery of treated water from the F. E. Weymouth Water Treatment Plant to 16 member agency service connections. Based on current seismic codes and recent projections of the magnitude of earthquakes which could occur on nearby faults, an initial assessment has identified that the San Gabriel Tower may be structurally unstable in the event of a major earthquake.

Time and Urgency

Metropolitan has an ongoing program to evaluate the seismic stability of its facilities in order to maintain reliable operation and to meet current seismic design practices and code requirements. Although Metropolitan facilities have always been designed to meet up-to-date codes that were in place at the time of their construction, industry practices and code requirements are periodically updated, particularly following a major earthquake. An initial seismic assessment utilizing updated code requirements has identified that the San Gabriel Tower is potentially unstable in the event of a major earthquake.

The San Gabriel Tower houses three slide gates which regulate and isolate flows on the Upper Feeder. A failure of the tower could result in rapid closure of the gates, causing hydraulic surges which would result in damage and shutdown of the Upper Feeder. Due to the critical nature of the facility in delivering treated water from the Weymouth plant to Three Valleys Municipal Water District, Upper San Gabriel Valley Municipal Water District, the cities of Pasadena and San Marino, Foothill Municipal Water District, and the Los Angeles Department of Water and Power, staff recommends moving forward with detailed seismic investigations to characterize site conditions and identify potential alternatives to upgrade the tower.

This project has been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and is categorized as an Infrastructure Reliability project. This project is budgeted within Metropolitan's CIP for fiscal year 2011/12.

Background

The San Gabriel Tower was constructed in 1936 and is located on the Upper Feeder, north of the city of Azusa. It sits at the base of the steep and weathered San Gabriel Mountains, between the west portal of Monrovia Tunnel No. 1 and the east portal of Monrovia Tunnel No. 2. The only access to the tower is via an "Arizona crossing" of the San Gabriel River which is impassible during periods of high river flow. The tower is surrounded by Angeles National Forest and is adjacent to Morris Reservoir, which is owned by the county of Los Angeles. It is situated between two active faults. The Sawpit Fault is located 1.5 miles north of the tower and is capable of generating a magnitude 6.5 earthquake. The Sierra Madre Fault is located 3.1 miles south of the tower and is capable of generating a magnitude 7.0 earthquake. The 86-foot tall free-standing San Gabriel Tower has a 24-foot by 14-foot rectangular base which sits atop a rock foundation. While the tower was designed and constructed to the

codes and standards in place during the 1930s, significant advancements have been made since that time in predicting the response and performance of structures as a result of seismic ground shaking. Staff has conducted an initial seismic assessment and has determined that there is potential for landslide and structural damage to the tower in the event of a major earthquake. A detailed seismic investigation is needed to identify and evaluate tower upgrade alternatives. If the tower were structurally damaged, the repairs would likely take many months to complete and could disrupt water deliveries for an extended period.

San Gabriel Tower Seismic Upgrade – Studies and Investigations (\$200,000)

The planned scope of work for these investigations includes: (1) evaluation of the tower's operational constraints; (2) surge analyses to determine hydraulic restrictions and impacts on the Upper Feeder and San Gabriel Spillway Structure if the tower were to be shortened; (3) mapping of topography in the immediate vicinity of the tower; (4) field investigations including geophysical testing and geologic mapping to obtain soil and rock characteristics, such as rock strength; (5) seismic and structural analyses to determine feasible retrofit schemes and options; and (6) preparation of preliminary construction cost estimates.

This action appropriates \$200,000 and authorizes detailed seismic investigations of the San Gabriel Tower. The work will primarily be performed by Metropolitan staff, with specialized assistance from GeoPentech, Inc., as discussed below. The requested funds include \$28,000 for structural analyses; \$30,000 for environmental permitting for the site investigations; \$22,000 for project management; \$100,000 for field investigations by GeoPentech, Inc.; and \$20,000 for remaining budget.

GeoPentech, Inc. – Agreement for Geotechnical Services (No action required)

The geotechnical investigations are recommended to be performed by GeoPentech, Inc. Since geotechnical site investigations are a technical specialty for which Metropolitan does not maintain in-house expertise, consulting firms are relied upon for support. GeoPentech, Inc. was selected through a competitive process via Request for Qualifications No. 931. The planned scope will include reviewing available geologic information and aerial photos; conducting field borings on-site; geologic mapping of rock slope bedding and foliation; performing seismic refraction surveys; determining the site characteristics and rock strength; and developing an earthquake response spectrum and time history of potential ground shaking.

All work will be performed under a new agreement planned to be awarded by the General Manager under his Administrative Code authority. The estimated cost for these services is \$100,000. GeoPentech is a Small Business Enterprise (SBE) firm, and thus achieves 100 percent SBE participation.

Summary

This action appropriates \$200,000 and authorizes detailed seismic investigations of the San Gabriel Tower. This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the fiscal year 2011/12 capital budget. See [Attachment 1](#) for a photograph of the San Gabriel Tower, [Attachment 2](#) for the Financial Statement, and [Attachment 3](#) for the Location Map.

The San Gabriel Tower Seismic Upgrade project is included within capital Appropriation No. 15441, the Conveyance and Distribution System Rehabilitation Program - Phase 2, which was initiated in fiscal year 2006/07. Appropriation No. 15441 also includes projects such as repairs of the Lake Skinner Outlet Conduit, Rialto Pipeline, San Diego Pipeline No. 5, and the Sepulveda Feeder. With the present action to upgrade the San Gabriel Tower, the total funding for Appropriation No. 15441 will increase from \$33,179,010 to \$33,379,010.

This project is consistent with Metropolitan's goal for sustainability by enhancing the reliability of existing distribution system in order to maintain reliable water deliveries in the future.

Project Milestone

December 2012 – Complete detailed seismic investigations of the San Gabriel Tower

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action consists of basic data collection and resource evaluation activities, which do not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded. Accordingly, the proposed action qualifies as a Class 6 Categorical Exemption (Section 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under a Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination and

- a. Appropriate \$200,000; and
- b. Authorize detailed seismic investigations of the San Gabriel Tower.

Fiscal Impact: \$200,000 in budgeted funds (Approp. 15441)

Business Analysis: This option would enhance the reliability of the distribution system.

Option #2

Do not authorize the project at this time.

Fiscal Impact: None

Business Analysis: This option would forego an opportunity to enhance the reliability of the San Gabriel Tower. Under this option, there would be an increased future risk of unplanned disruption of water deliveries to member agencies.

Staff Recommendation

Option #1



Gordon Johnson
Manager/Chief Engineer,
Engineering Services

11/30/2011

Date



Jeffrey Kightlinger
General Manager

12/1/2011

Date

[Attachment 1 – Photograph of the San Gabriel Tower](#)

[Attachment 2 – Financial Statement](#)

[Attachment 3 – Location Map](#)

Photograph of San Gabriel Tower



Financial Statement for Conveyance and Distribution System Rehabilitation Program – Phase II

A breakdown of Board Action No. 38 for Appropriation No. 15441 for the San Gabriel Tower Seismic Upgrade¹ is as follows:

	Previous Total Appropriated Amount (July 2011)	Current Board Action No. 38 (December 2011)	New Total Appropriated Amount
Labor			
Studies & Investigations	\$ 2,119,500	\$ 44,000	\$ 2,163,500
Final Design	2,741,000	-	2,741,000
Owner Costs (Program mgmt, permitting)	4,101,852	34,000	4,135,852
Submittals Review & Record Drwgs	30,750	-	30,750
Inspection & Support	1,503,050	-	1,503,050
Metropolitan Force Construction	7,785,712	-	7,785,712
Materials & Supplies	1,459,400	-	1,459,400
Incidental Expenses	777,900	2,000	779,900
Professional/Technical Services (Geopentech)	1,676,002	100,000	1,776,002
Equipment Use	283,002	-	283,002
Contracts	8,560,730	-	8,560,730
Remaining Budget	2,140,112	20,000	2,160,112
Total	\$ 33,179,010	\$ 200,000	\$ 33,379,010

Funding Request

Program Name:	Conveyance and Distribution System Rehabilitation Program – Phase II		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15441	Board Action No.:	38
Requested Amount:	\$ 200,000	Capital Program No.:	15441-I
Total Appropriated Amount:	\$ 33,179,010	Capital Program Page No.:	35
Total Program Estimate:	\$ 33,379,010	Program Goal:	I-Infrastructure Reliability

¹The total amount expended to date on the San Gabriel Tower Seismic Upgrade project is approximately \$147,000.

San Gabriel Tower

