



Agenda Item No. (6)

To: Building and Operating Committee/Committee of the Whole
Meeting of June 26, 2025

From: John R. Eberle, District Engineer
David Rivera, Deputy General Manager, Bridge Division
Denis J. Mulligan, General Manager

Subject: **APPROVE ACTIONS RELATIVE TO EXECUTION OF PROFESSIONAL SERVICES AGREEMENT NO. 2025-B-040, GOLDEN GATE BRIDGE STRONG MOTION INSTRUMENTATION PROGRAM, WITH THE STATE OF CALIFORNIA, DIVISION OF MINES AND GEOLOGY**

Recommendation

The Building and Operating Committee recommends that the Board of Directors approve the following actions relative to Professional Services Agreement (PSA) No. 2025-B-040, *Golden Gate Bridge Strong Motion Instrumentation Program*:

1. Authorize execution of PSA No. 2025-B-040, with the State of California, Division of Mines and Geology, in an amount not-to-exceed \$259,530, to perform for three years monitoring, testing, inspections, and repairs of the Golden Gate Bridge seismic instrumentation system; and,
2. Establish a 10% contingency for PSA No. 2025-B-040, in the amount of \$25,953,

with the understanding that sufficient funds are available in the Fiscal Year (FY) 25/26 Bridge Division Operating Budget to finance the estimated \$80,300 FY 25/26 expenses under PSA No. 2025-B-040.

This matter will be presented to the Board of Directors at its June 27, 2025, meeting for appropriate action.

Summary

The State of California, Division of Mines and Geology, Strong Motion Instrumentation Program (SMIP), manages a network of seismic instrumentation systems on all toll bridges in the Bay Area and throughout the State, including the system on the Golden Gate Bridge (Bridge). SMIP personnel have specialized training and equipment to install, operate, and maintain these instrumentation systems.

The purpose of the instrumentation system is to record information regarding the intensity of motions imposed on bridge structures by earthquakes. SMIP gathers this information to analyze the effects of earthquakes on bridge structures. As a part of the management of the instrumentation systems on the bridges, SMIP performs monthly electronic monitoring of the systems to ensure that all components are operational and transmit any readings the sensors may detect after an earthquake. The Golden Gate Bridge, Highway and Transportation District (District) uses the information provided by the instrumentation system to assist with determining the required level of post-earthquake inspections and to perform structural analysis for determining any required repair measures.

The Bridge seismic instrumentation system consists of 125 sensors located on the different structures of the Bridge and four recording stations located on the North Anchorage Housing, the North Tower, the South Tower, and Pylon S1. The system is connected to the Sacramento office of SMIP for data transmittal and monitoring purposes.

On August 26, 2022, the Board authorized execution of PSA No. 2022-B-061, *Golden Gate Bridge Strong Motion Instrumentation Program*, with the State of California, Division of Mines and Geology, for three years of monitoring, testing, inspecting, and if necessary, repairing the Bridge's seismic instrumentation system. This service agreement expires on June 30, 2025. Staff recommends that the District enter into a new three-year agreement with SMIP to continue performing field maintenance and service of the instrumentation system. The scope of services to be provided by SMIP will include the following:

1. Monthly electronic monitoring of the system to ensure that all components are operational.
2. Semi-annual testing of the system to ensure that the instrumentation components are operational and functioning accurately.
3. Annual physical inspection of the recording system to ensure the reliability of the system.
4. Troubleshooting and repair of the system as necessary to ensure reliability, including replacement of minor electronic parts.
5. Quarterly reports of seismic events and maintenance, including presentation of all earthquake records over 2% g in amplitude, and a summary of the results of the above maintenance activities.
6. Periodic testing performed off-site by remote electronic control using SMIP-provided communication units.
7. Transmission of near-real-time strong motion earthquake data to the District's pagers, cell phones, and email accounts to provide guidance for bridge inspections in accordance with the District's Earthquake Response Plan, and transmission of monthly test data to verify the performance of the communication system.
8. On-call field work to relocate sensors and conduits as needed due to ongoing and upcoming construction contracts at the Bridge.

SMIP provided a cost estimate in the not-to-exceed amount of \$259,530 for three years of performing the above noted services. This amount includes a budget of \$100,000 for potential on-call field work to relocate sensors and conduits. The District reviewed and discussed the cost estimate with SMIP and determined that the costs are fair and reasonable for the work being performed.

Staff recommends that the Building and Operating Committee recommend that the Board authorize execution of PSA No. 2025-B-040, *Golden Gate Bridge Strong Motion Instrumentation Program*, with SMIP in the not-to-exceed amount of \$259,530 for the work scope and duration presented in this staff report. Staff also recommends that a contract contingency in the amount of \$25,953 be established for any additional or changed scope of services that may develop while work progresses.

Background

The Governor's Board of Inquiry on the Loma Prieta Earthquake recommended the installation of seismic instrumentation on the Golden Gate Bridge. The Bay Conservation and Development Commission reinforced this recommendation during its hearings on the seismic analysis of the Bridge.

The Board, by Resolution No. 91-263, authorized negotiation with the State of California, Division of Mines and Geology – *Strong Motion Instrumentation Program* (SMIP), for the procurement and installation of a seismic instrumentation system and authorized forming a Seismic Instrumentation Advisory Panel to assist the District to plan and design the Seismic Instrumentation System.

The Board, by Resolution No. 92-194, authorized execution of an Interagency Agreement with the State of California, Division of Mines and Geology – *SMIP*, for the procurement and installation of the Phase I Seismic Instrumentation System for the Golden Gate Bridge. This system, consisting of 76 sensors (72 acceleration sensors and 4 displacement sensors) distributed over the entire Bridge and 2 recording stations, was completed in July 1995. The Phase II Seismic Instrumentation System, consisting of 25 sensors for the South Approach Structures and 24 sensors for the North Viaduct and the North Anchorage Housing, and 2 recording stations at Pylons S1 and North Anchorage, was installed in stages between 2003 and 2008 as part of the Phase II Seismic Retrofit Project.

The seismic sensors on the Bridge were originally linked by telephone to the SMIP office in Sacramento, California. In February 2020, the Board, by Resolution No. 2019-074, authorized execution of Professional Services Agreement No. 2019-B-056, *Golden Gate Bridge Strong Motion Instrumentation Program*, with the State of California, Division of Mines and Geology, to update the Golden Gate Bridge recording station instrumentation system. The agreement included purchasing, installing, and testing new equipment as well as performing field inspections of the system, and troubleshooting and repairing it as necessary. The new equipment included new multiple-channel recorders, internal high-speed modem, GPS timing and recording equipment with larger memory cards. The new system is connected to Sacramento by Ethernet for faster, near-real-time transmission of data.

When peak accelerations and velocities that exceed a pre-established minimum threshold are detected, the data recorded at the Bridge is transmitted to SMIP in Sacramento. There, a computer algorithm automatically analyzes the data and classifies the event as weak, light, moderate, severe, or extreme. This classification, along with the measured values of several key parameters, is then

transmitted back to the District. This entire process is automatic and is completed in a timely manner.

Depending on the intensity of the earthquake, the Bridge's Earthquake Response Plan will initiate a series of sequential inspection tasks, beginning with an immediate visual inspection of the roadway for obvious damage, followed by an initial damage assessment made by teams of specially trained maintenance personnel. Then, if necessary, a detailed engineering analysis of the Bridge computer model utilizing the seismic instrumentation data will be conducted to estimate the capacity of structural members for consideration of repairs.

Fiscal Impact

The total estimated cost of services under PSA No. 2025-B-040, including contingency, is \$285,483 and will be 100% District funded. The FY 25/26 Bridge Division Operating Budget includes sufficient funds to pay for the first year of SMIP services, in the amount estimated at \$80,300. The remaining amount of \$205,183 will be budgeted accordingly in the Bridge Division Operating Budgets for FY 26/27 and FY 27/28.