

Agenda Report

August 21, 2023

TO: Honorable Mayor and City Council

FROM: Department of Public Works

SUBJECT: SELECTION OF STRUCTURAL RETROFIT APPROACH FOR CENTRAL LIBRARY EARTHQUAKE RETROFIT AND BUILDING REPAIRS PROJECT

RECOMMENDATION:

1. Find the proposed action herein to be categorically exempt under the California Environmental Quality Act (CEQA) Guidelines in accordance with Title 14, Chapter 3, Article 5, Section 15061(b)(3), the commonsense rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment; and
2. Direct staff to proceed with the Concrete Shear Wall structural retrofit approach for the Central Library Earthquake Retrofit and Repair project.

EXECUTIVE SUMMARY:

Constructed in 1927, the Central Library serves as one of three pillars of Pasadena's Civic Center Plan. The City of Pasadena recognizes the importance of repairing the Central Library while simultaneously preserving its charm, restoring it to its original character, and bringing it into the 21st century. This endeavor combines historical preservation with necessary seismic upgrades, which will result in a unique space that meets the needs of both the community and future generations.

A preliminary seismic evaluation of the building's structural system was completed in April 2021 indicating that the building is an unreinforced masonry (URM) structure and is not in compliance with Pasadena Municipal Code nor does it meet the minimum structural performance objectives. In addition, after research and visual inspection of the building, significant cracks along the interior URM and hollow clay-tile walls were observed and were a cause for concern. Given such findings, on May 3, 2021, City officials closed the Central Library acting in the best interest of the public and its employees.

On February 6, 2023, City Council authorized the City Manager to enter into a contract with Gruen Associates as the best-qualified design team to prepare environmental documents and construction drawings for the seismic retrofit and building repairs to the Central Library. The design team is made up of experienced engineers, architects, and historic preservation specialists.

A Technical Oversight Committee (TOC) appointed by the Mayor and a Community Programming Committee appointed by the City Manager were established to advise the design team in the development of the optimal and least impactful retrofit approach and to enhance the library's services considering current and future needs of the community. The committees are comprised of community leaders with expertise in a variety of areas including architecture, historic preservation, structural engineering, and library operations.

Over the past six months, the design team has vetted multiple retrofit alternatives with the TOC and the City's structural peer review advisory team comprised of Nabih Youssef and Associates (NYA) and Krakower & Associates. The number of alternatives has been narrowed to three based on the evaluation criteria set forth by the project's established goals and objectives. The final three approaches are noted in the staff report as Baseline, Concrete Shear Walls, and Base Isolation. The approaches vary in expected earthquake performance ranging from meeting minimum code requirements for historic buildings to exceeding code requirements for new buildings. The costs for the approaches also vary with Baseline and Concrete Shear Walls estimated to have similar costs while Base Isolation is estimated to be much more expensive.

Based on all the factors considered by the design and project team, staff recommends that City Council select the Concrete Shear Wall earthquake retrofit approach and direct staff to proceed with detailed design of the project.

BACKGROUND:

Constructed in 1927, the Pasadena Central Library, designed by Myron Hunt and H.C. Chambers, was the first building completed in Pasadena's Civic Center Plan. Listed on the National Register of Historic Landmarks, the Civic Center consists of Central Library, City Hall, and the Civic Auditorium. Central Library is comprised of two stories above grade and a basement story below grade and is approximately 120,000 square feet in area.

The library has numerous historic character-defining features. The building's exterior Mediterranean Revival style is defined by its walled entrance courtyard with central fountain; red clay tile roofs; and exterior stucco with cast stone decorative trim. The interior character-defining features include the main circulation hall with its high ceilings; built-in casework with integrated air conditioning delivery system; wood wainscot with acoustic plaster above; and decorative light fixtures. The building was expanded in the mid-1960s to include a children's story room and two reference wings, and a historically sensitive interior restoration was undertaken in the late 1980s. Although several improvements and repairs have been made to the library over the decades, many of the

building's existing systems and components are original to the 1927 construction and beyond their useful life.

The Central Library has been a home to a wide variety of programs and services for all Pasadena residents. Annually, 30,000 - 40,000 community members attended story times, author visits, cultural events, Art Night, recitals, plays, and many other programs. In the year prior to the COVID-19 pandemic closure, the library hosted 232 group events and 876 community and organization meetings. In addition, the library is home to the Office of the Young Child which leads the implementation of the City's Early Child Development Policy.

With Central Library approaching its centennial birthday, an assessment of the building's condition and its various systems was initiated in 2020. The goal of the *Central Library – Building Systems and Structural Assessment* project was to provide a general assessment of the various building systems including the mechanical, plumbing, electrical, and roof; assess the building's existing structural condition; and design a new fire alarm and fire sprinkler system as a result of previously identified deficiencies. As part of this project, the City retained KPFF Consulting Engineers (KPFF) to investigate and evaluate the structural system of the building. It was during this building assessment that it was revealed that the building is an unreinforced masonry (URM) structure, with URM bearing walls that are not fastened to the building's foundation nor to the reinforced concrete floor beams and timber roof they support. This URM status had not been previously identified in any survey of public buildings in Pasadena and previous improvements to the buildings did not evaluate nor address seismic performance.

URM buildings have been widely recognized to be a hazard to life safety due to the potential for collapse during a seismic event and must be evaluated and retrofitted or demolished per Pasadena Municipal Code (PMC) Section 14.06.030 passed in 1993. As such, a preliminary seismic evaluation of the building's structural system was completed by KPFF in April 2021. In short, the results indicated that the building does not meet the structural performance objectives recommended by the American Society of Civil Engineers (ASCE 41-17) and is not in compliance with PMC Chapter 14.06. In addition, after research and visual inspection of the building, significant cracks along the interior URM and hollow clay-tile walls were observed and were a cause for concern. Given such findings, on May 3, 2021, City officials closed the Central Library acting in the best interest of the public and its employees, and out of concern that a failure of the building in the event of an earthquake could be catastrophic.

A competitive selection process was initiated by the City's Public Works Department in November 2021 to select the best-qualified design team to prepare environmental documents and construction drawings for the earthquake retrofit and repair of the Central Library. After review of proposals from qualified firms, a professional services contract was awarded to Gruen Associates on February 6, 2023. Gruen Associates and their qualified team of sub-consultants are handling all aspects of the project including structural engineering, library programming, public outreach, environmental

documentation, historic preservation, and preparation of final construction drawings and cost estimates for structural retrofit and building system repairs. At the time of award, City Council directed staff and the design team to return to City Council with three viable earthquake retrofit approaches. City Council would evaluate the merits of each approach and provide direction on which approach should proceed to final design.

Concurrent with the competitive design team selection process, the City also contracted with Nabih Youssef and Associates (NYA), an internationally recognized structural engineering firm specializing in earthquake engineering of historical buildings, to perform an independent re-evaluation of KPFF's preliminary seismic evaluation of the building's structural system to further validate the KPFF report. In addition, NYA was to assess and consider data collected from testing of existing materials in the library collected after the KPFF report was prepared. As a result, NYA concurred with KPFF's findings and conclusions from their April 2021 preliminary seismic evaluation report.

In an effort to retain independent structural expertise throughout the design phase, the City retained NYA to provide independent structural peer review and to advise the project team including review of retrofit design approaches and final design documents. The City also retained Krakower & Associates to provide historical knowledge of the building since Mr. Krakower was directly involved with the design of library stacks that were constructed in the library in the 1980s.

In order to have community leaders provide their expertise and oversight, in Fall 2022, a Technical Oversight Committee (TOC) appointed by the Mayor and a Library Community Programming Committee appointed by City Manager were established to advise the selected design team in the development of the optimal and least impactful retrofit scheme and to enhance the library's services considering current and future needs of the community while preserving the historical, character-defining features of the building.

DEVELOPMENT OF EARTHQUAKE RETROFIT APPROACHES:

PROJECT GOALS AND OBJECTIVES

After collecting input from the library's stakeholders and the community through various outreach events and surveys, the project's goals and objectives were established. These goals and objectives were then utilized in the development and evaluation of numerous earthquakes retrofit approaches. The goals and objectives are as follows:

- EARTHQUAKE REPAIRS – Improve seismic performance to allow the building to have greater resilience to earthquakes.
- HISTORIC IMPACTS – Preserve the building's historic fabric, its character defining features, and its historic listings.
- ACCESSIBILITY – Adopt universal access principles to accommodate different levels of ability and mobility.
- PUBLIC BENEFIT – Re-occupy building as quickly as reasonable so that patrons can have use of the library and its services.

- BUILDING SYSTEMS – Ability to upgrade building systems (HVAC, electrical, plumbing, fire alarm and fire sprinklers, technology) without significant impacts.
- FUNCTION / FLEXIBILITY – Ability to utilize spaces as desired into the future.
- COST EFFECTIVENESS – Lowest cost that meets earthquake performance goals.

A Basis of Design (BOD) was developed which documents the principles, assumptions, rationale, design criteria, and considerations for the design process and defines the parameters used for calculations and decisions. Ultimately, the BOD provides the desired performance objectives for the building including the design earthquake hazard levels (size and expected frequency of an earthquake event) and how the building will react in regard to life safety. The BOD for the Central Library project establishes that the building's structural retrofit approach should meet the performance code requirements of a new building. The BOD was reviewed and accepted by the TOC.

EARTHQUAKE REPAIR APPROACHES

I. Baseline Approach Characteristics

- Removes limited amounts of inner brick “wythe” (a vertical section of masonry wall comprised of several layers of brick) and replaces it with concrete columns to support remaining brick and support floors and roof;
- Permanent formwork to be installed and remain in place to support the backing of the columns;
- Does NOT meet BOD for new building structural performance in the event of an earthquake; and
- Minimum retrofit needed to meet Pasadena Unreinforced Masonry (URM) Ordinance and California Historic Building Code.

Pros and Cons:

- Pros: Lowest cost; and shorter construction duration.
- Cons: Lowest structural performance level of three approaches resulting in potential for increased damage during moderate and major earthquakes; and constructability concerns for forming columns in relationship to the demolition of the URM walls.

II. Concrete Shear Wall Approach (RECOMMENDED) Characteristics

- Removes entire inner-brick “wythe” and replaces it with a concrete shear wall which supports the outer “wythe” of brick and also acts as support for the floors and roof;
- Permanent formwork to be installed and remain in place to support the backing of the shear walls; and
- Meets BOD for new building structural performance in the event of an earthquake.

Pros and Cons:

- Pros: Lowest cost approach that meets BOD; shorter construction duration (same as Baseline Approach); most common and proven engineering and construction approach.
- Cons: Greater potential for damage and longer recovery time after major earthquakes compared to Base Isolation Approach

III. Base Isolation Approach Characteristics

- Utilizes base isolators under the ground floor around the perimeter and at every column to reduce the effects of an earthquake;
- Removes limited amounts of existing inner-brick “wythe” and replaces it with concrete columns to support remaining brick and support floors and roof;
- Permanent formwork to be installed and remain in place to support the backing of the columns; and
- Exceeds BOD for new building structural performance in the event of an earthquake.

Pros and Cons:

- Pros: Shortest recovery time after major earthquake compared to Baseline and Concrete Shear Wall approaches; reduces magnitude of ground motion impacts and, therefore, reduces potential for damage in moderate and major earthquakes.
- Cons: Highest cost; longest design and construction duration delaying project completion up to a year; reduces amount of basement’s usable square footage compared to the Baseline and Concrete Shear Wall approaches; and constructability concerns for forming columns in relationship to the demolition of the URM walls.

Attachment A shows the existing structure and each proposed earthquake retrofit approach. Attachment B depicts the expected structural performance level of each approach.

COST PLAN:

As part of developing possible retrofit approaches, the design team’s cost estimator, MGAC, developed a cost plan to provide a cost range for each approach. The cost plan includes all anticipated costs for construction, associated contingencies, future cost escalations based on an anticipated construction start date of Fall 2025; project and construction management; inspections and move-in.

The following table compares the cost ranges of the three retrofit approaches. The table is broken down into two categories. The first category is the scope of work that must be included as part of each earthquake retrofit work to be able to open and occupy the library (lifting the building’s red tag). The second category is the scope of work that could be deferred to a subsequent project but would result in higher future cost.

Each of the following three retrofit approaches is composed of the following two major components:

1) Earthquake & Fire/Life Safety Compliance - All approaches include the following scope of work:

- Retrofit of the structural system of the building entailing
 - Documentation and cataloging of historic finishes;
 - Removal of interior wall finishes to access the structure behind;
 - Removal and re-installation of millwork to their original locations;
- New fire alarm and fire sprinkler system;
- Repairs to existing roof and building envelope to prevent water intrusion; and
- Upgrades to meet current ADA accessibility codes.

2) Building Repairs - All approaches include the following scope of work:

- Replacement of existing mechanical, electrical, and plumbing systems;
- Upgrades to building technology;
- Tenant-improvements for library programming and office spaces; and
- Site improvements including the courtyard, parking lot and building entrances.

	Baseline (\$million)	Concrete Shear Wall (\$million)	Base Isolation (\$million)
1. Earthquake & Fire Life Safety Compliance <ul style="list-style-type: none"> • Structural Retrofit • Fire Alarm and Sprinkler System • Roof Repairs • ADA Upgrades (Code Required) 	\$128 - \$148	\$133 - \$153	\$178 - \$198
2. Building Repairs <ul style="list-style-type: none"> • Mechanical, Electrical & Plumbing Systems Replacement • Technology Upgrades • Tenant Improvements • Site Improvements 	\$42	\$42	\$42
TOTAL COST (Construction Phase)	\$170 - \$190	\$175 - \$195	\$220 - \$240

Although building repairs listed in item 2 above may be deferred, there are economical, operational and community service-related considerations and impacts. The library's operational systems are all original to the building and are past their useful service life. Upgrade of the century-old mechanical, electrical and plumbing systems is critical for continued operation of the building and uninterrupted service to the community. Should the City decide to defer the building repairs five years after the retrofit and re-opening of the library, the \$42 million cost for item 2 repairs would increase to a magnitude of

approximately **\$91 million**. Given the closure of the building, the City is presented an opportunity to leverage the earthquake retrofit work to bring the library into the 21st Century.

EVALUATION OF APPROACHES:

In order to compare and evaluate each retrofit approach and determine the recommended approach, the design team prepared a matrix that compared each approach based on the project’s goals and objectives. A summary table is included below and the detailed backup to the summary table is included in Attachment C.

PROJECT GOALS	BASELINE APPROACH	SHEAR WALL APPROACH	BASE ISOLATION APPROACH
EARTHQUAKE REPAIRS - Performance equivalent to a new building		✓	✓
HISTORIC IMPACTS - Ability to maintain character defining features and historic listing	✓	✓	✓
ACCESSIBILITY - Ability to make building meet universal design and ADA	✓	✓	✓
PUBLIC BENEFIT - Time needed to restore Library to Public Use	✓	✓	
BUILDING SYSTEMS - Ability to upgrade the building systems without significant impacts	✓	✓	✓
FUNCTION/FLEXIBILITY - Ability to utilize spaces in the manner desired without impacts	✓	✓	✓
COST EFFECTIVENESS - Lowest cost that meets earthquake performance		✓	

As depicted by this table and attached matrix, the Concrete Shear Wall approach meets the intended project goals and provides the greatest public benefit as compared to the anticipated costs.

PUBLIC OUTREACH AND COMMISSION MEETINGS:

The following community outreach events were hosted by City staff and the design team to provide project updates and address inquiries:

- May 24, 2023 – Community Outreach Meeting @ Jefferson School
- May 31, 2023 – West Pasadena Residents’ Association Annual Meeting @ Maranatha High School
- July 8, 2023 – Farmers’ Market Pop-Up Event @ Victory Park
- July 15, 2023 – Colorado Street Bridge Party Pop-Up
- August 1, 2023 – National Night Out Pop-Up @ Civic Center

The project team presented each of the described retrofit approaches as an informational item to the Historic Preservation Commission on July 18, 2023, the Library Commission

on July 19, 2023, and the Design Commission on July 25, 2023. Each commission commented and supported staff's recommendation of proceeding with the Concrete Shear Wall approach.

NEXT STEPS:

Pursuant to City Council's direction of a preferred earthquake retrofit approach, the design team will continue with development of environmental documentation and construction documents. As design moves forward, staff will provide updates to City Council at project milestones and will present a funding strategy at a future City Council meeting. In addition, public outreach efforts with the community will continue to provide updates and collect public feedback.

Project Timeline

- Fall 2023 - 30% (Schematic) Plans and Cost Estimate
- Spring 2024 - 60% (Design Development) Plans and Cost Estimate
- Fall 2024 – Potential Bond Measure
- Spring 2025 - 100% (Construction Document) Plans, Cost Estimate and Plan Check
- Summer 2025 - Bid and Construction Contract Award (pending funding)
- Fall 2028 – Anticipated Building Re-opening

ENVIRONMENTAL ANALYSIS:

This step in the process is not subject to the California Environmental Quality Act (CEQA) in accordance with Section 21065 of CEQA and State CEQA Guidelines Sections 15060 (c)(2), 15060 (c)(3), and 15378. The specific design and subsequent improvements to Central Library will be subject to appropriate project-level environmental review at the time each is brought forward for first discretionary action.

FISCAL IMPACT:

To date, the City has secured \$9 million from the State to fully fund the project's design and environmental documentation phase. Currently the construction phase of the project is unfunded. The City will continue to seek funding opportunities from State, federal, non-profit, and private sources to support the construction of the project. This may include applying for grants, utilization of CIP funds, earmarking additional general funds, seeking out community stakeholders and non-profit organizations, and engaging partnerships with our current library organizations vested in historic and architectural preservation of the Central Library - all of which can offset the final cost estimate. The project's aggressive design timeline provides the City the option to consider voter-approved financing should it be necessary to close the gap and fully fund a project of this magnitude.

Respectfully submitted,



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Director of Public Works

Prepared by:

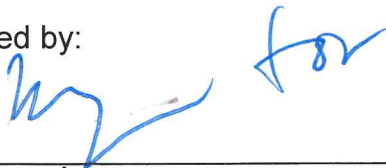


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Attachment A – Existing Structure and Earthquake Retrofit Approaches
Attachment B – Structural Performance Comparison Chart
Attachment C – Retrofit Approach Comparison Matrix