

Executive Summary

A. Introduction

Stantec Architecture, Inc. was retained by the California Department of General Services (DGS) to perform an infrastructure study on the Board of Equalization (BOE) headquarters building located at 450 N Street in Sacramento, CA. The BOE headquarters building consists of a 25-story, 602,519 gross square foot tower with an adjacent 4-level parking garage. The tower was constructed in 1992. The garage was constructed in 1963.

The infrastructure study was intended to be a rapid review to give a high level assessment of the existing conditions at the BOE headquarters building. Visual assessments only were performed. Invasive inspections to reveal hidden conditions, testing of mechanical and electrical equipment, and investigations for water infiltration or mold were not included in the scope or work. Sample collecting of suspect hazardous materials is being performed on a very limited scope to verify whether hazardous materials are present.

The following floors in the tower were visually assessed:

- Remediated floors 22, 23, 24
- Restricted floors 2, 3, 5, 17, 19
- Floor 1
- Typical floors 10, 15, 21

Typical floors were assessed with the understanding that floors not assessed were similar.

This infrastructure study was performed by Stantec's Sacramento office under Christopher Wilson, AIA, LEED AP, principal-in-charge. The Stantec team conducted site assessments during the weeks of February 9, 2009 and March 16, 2009. The assessments were conducted primarily between the hours of 6 PM to 12 AM.

The Stantec team consists of the following members:

Stantec Architecture, Inc.	Architectural analysis LEED-EB analysis
Stantec Consulting, Inc.	Civil analysis Plumbing/Mechanical analysis Fire Protection analysis Electrical/Fire Alarm analysis Hazardous Materials analysis
Buehler & Buehler Structural Engineers	Structural analysis
TEECOM Design Group	Telecommunications analysis
Marquis Systems, Inc.	Security analysis
Thornton Tomasetti	Exterior Skin maintenance
Architectural Elevator Consulting, Inc.	Vertical Transportation analysis
Leland Saylor Associates.....	Cost Estimating analysis

B. Acknowledgements

The following persons provided invaluable assistance in the preparation of this report:

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C. Code Compliance

The BOE headquarters building was visually assessed to identify potential deficiencies per the current 2007 California Building Code (CBC). The original building appears to have been constructed according to code requirements at the time of construction. It should be noted that generally the majority of these deficiencies are not required to be corrected until major renovations occur.

For example, seismic deficiencies should be corrected if a) the total construction cost exceeds 25% of the construction cost for the replacement of the existing building, b) there is a change in use/occupancy category, c) the modification to the structural components increases the seismic forces in or strength requirements of any structural component of the existing building structure by more than 10% cumulative, d) structural elements need repair where the damage has reduced the lateral-load resisting capacity of the structural system by more than 10%, or e) changes in live or dead load increase story shear by more than 10% (2007 CBC 3415.3.1).

Accessibility deficiencies should be corrected in the area of modification and/or repair. The cost of accessibility modifications is limited so that it does not become disproportionate to the total construction cost. Accessibility modifications are also prioritized by building elements that will provide the greatest access (see CalDAG 2009 Interpretive Manual, page 37 and 2007 CBC 1133B.1 and 1134B.2).

D. Summary

Visual assessments at the 450 N Street building revealed that some infrastructure components are adequate for a typical commercial building. Examples include the structural lateral-force resisting system for the tower, electrical power, telecom, and civil infrastructures. Other components, such as the fire alarm system and security system, are still operational but reaching the end of their service life. Building infrastructure components that do not comply with current codes or meet current industry standards include the existing mechanical system and some fire/life safety components. A general description of the assessment findings is summarized below.

Structural: The building tower was structurally evaluated using an ASCE 41-06 non-linear dynamic procedure. The results indicate that the building tower meets 2007 California Building Code (CBC) Level 1 and Level 2 criteria. The existing garage was evaluated under an ASCE 31 Tier 1 screening phase to determine if there are any potential deficiencies in the structural lateral force resisting system. Several items were deemed non-compliant which included the bracing of the mechanical mezzanines, first and second story shearwalls, and uplift at the pile caps.

Electrical: The existing electrical power infrastructure is adequate to meet the building's existing needs; however, there are non-compliant code items regarding access to the main electrical room, lack of panic hardware at the parking garage electrical room, transformer

grounding, and a lack of dedicated circuits for printers in the tenant improvement areas. An analysis of the existing lighting system revealed that emergency light fixtures have reached the end of their useful lives and should be replaced. Dual level switching capability has been provided in the open office areas but the existing wiring and switching does not utilize this capability. Lighting levels in the parking garage are below recommended levels for safety and security.

Telecommunications: The majority of the existing telecommunications/IT infrastructure meets current codes and standards. There are concerns with firestopping at pathways and cables, cable supports, and cable ratings for plenum spaces.

Civil: The existing building drainage system is adequate to meet the building's needs.

Fire Alarm: The fire alarm system is approaching 20 years in age. It is still operational but it is reaching the end of its service life.

Security: A security analysis has revealed several concerns with the building perimeter and with uncontrolled access to the parking garage. The electronic security system is more than adequate for a typical commercial office building. The system has undergone upgrades over the years; however additional improvements can be made to the security cameras. A particular concern is the building keying system. The operational policies should be reviewed and controls implemented.

Mechanical: Corrosion is occurring at the chilled water coils and cooling tower discharges. A complete rebalance of the mechanical systems is recommended for occupant comfort and air quality. A complete upgrade of the Building Automated Control System (BACS) is recommended because the system is reaching the end of its service life.

Fire Protection: A Halon fire suppression system is provided in the main computer room, telecom room and printing room. Current code has superseded Halon as a fire suppressant for less ozone-depleting extinguishing agents such as Energon and FM200.

Fire/Life Safety: The exit width at the ground floor exit doors from Stair 2 in the tower do not comply with exiting calculations based on the current building code. Portable breathing tanks for firefighters are located in Stair 2. The California State Fire Marshal has noted these tanks as an existing non-conforming condition. The location of the tanks would be subject to review and possible relocation at the next major renovation project.

Accessibility: The majority of accessibility issues occur at the first floor where landings at building exits are not level per code and the slopes and cross-slopes of entry walkways do not comply with ADA requirements. Accessible features such as an assistive listening system and accessible seating were missing in the Board Room on the first floor.

Exterior Skin: The exterior skin of the building was visually assessed and it appears to be in relatively good condition. The remedial work performed under separate contracts

has created a “face sealed” exterior wall system that will require regular maintenance and eventual replacement of the gaskets and sealant.

Roof: The tower roof is less than one year old and appears to be in good condition. The garage roof has flashing and expansion joints that were modified and repaired during the water infiltration remediation project at this location.

Vertical Transportation: Newer electronics and controls are available. Improved maintenance will allow the elevators to provide service for up to an additional 20 years.

Hazardous Materials: Stantec performed a screening survey for suspect asbestos containing materials (ACMs) and lead-based paint on a limited number of floors. No ACMs were found and the lead content in the paint samples was within acceptable limits. A comprehensive hazardous material and lead-based paint survey should be performed for an estimated cost of \$30,000 prior to any renovation or demolition work. Also, during the visual assessment Stantec found hydraulic oil and diesel fuel leaks that should be corrected.

LEED: The feasibility of attaining LEED-EB silver will depend greatly on the ability to achieve Energy & Atmosphere (EA) prerequisites for minimum energy efficiency. The existing mechanical system does not comply with the prerequisites, but if the recommended mechanical upgrades are implemented, then it is probable that LEED-EB silver can be attained when other improvements and upgrades are implemented. (Mechanical calculations were not included in the scope of work for this infrastructure study.)

The cost estimate for the recommended repairs to the 450 N Street building is approximately \$10.6 million (see attached cost estimate by Leland Saylor Associates). Mechanical, fire alarm, and façade maintenance represent the largest repair/maintenance costs.

Pre-programming: BOMA calculations indicated a total gross square footage of 602,519 with a total usable area of 517,097 square feet for the 450 N Street building. The total number of occupants on floors 2 through 24 with a corridor around the building core is 2218 occupants. The total number of occupants on floors 2 through 24 without a corridor around the building core is 2389. The existing elevator system for the office tower cannot support the projected load of 2389 occupants. However, the existing stairs, restrooms, HVAC system, and electrical system can support 2389 occupants.

E. Recommendations

Stantec recommends corrections to the deficiencies that were observed during the course of the infrastructure study for a total estimated cost of \$10.6 million. These corrections have been prioritized by the criteria provided by DGS:

Priority 1—Items to be completed immediately to meet fire/life safety regulations

Priority 2—Items that are fairly urgent but can be performed in the next 2-5 years

Priority 3—Wish list items or deferred maintenance items

The amount for priority 1 deficiency corrections is \$1.9 million. The amount for priority 2 and priority 3 corrections is \$6.5 million and \$2.2 million, respectively. These costs are construction costs only and do not include soft costs or any adjustments such as escalation or contingency.

The following is a brief summary of priority 1 life safety concerns that were observed:

- Seismic concerns at the garage.
- Protruding objects along the first floor egress path.
- Portable air tanks in stair 2 and first floor corridor configurations which should be reviewed with the State fire marshal during any modifications that affect these areas.

In addition to life safety concerns, the following recommended corrections have also been noted as priority 1:

- Board Room accessibility items such as the need for an assistive listening system and accessible seating.
- Code compliant accessible parking.
- Building keying system requires a study to determine how to resolve the compromised keying system. If cost becomes a factor, then priority can be given to revising the keying system for the restricted floors.
- Several security concerns pertaining to unauthorized access to the garage.
- Several security concerns pertaining to the building perimeter particularly along 4th Street.

The following recommended upgrades to systems approaching the end of their service life have been given a priority 2 ranking:

- Upgrading the mechanical system building automated control system (BACS) for \$2 million.
- Upgrading the fire alarm system for \$1.5 million.
- Replacing Halon as a fire suppressant with a less ozone-depleting suppressant such as Energon or FM200 for \$56,700.

Façade maintenance is estimated at \$1 million. Its priority 3 ranking is due to the time factor and is not an indication of relative importance. Façade maintenance consists of curtain wall gasket and sealant replacement work which is separated into 1) work on alternating spandrels at the south and west facades scheduled for 2014 and 2) replacement for all facades scheduled for 2019. The bi-annual façade inspections are priority 2 and estimated at \$20,000. The bi-annual roof inspections are also priority 2 and estimated at \$7500.