BUILDING COMMITTEE MEETING
Tuesday, April 25, 2017 at 7:30 am
Headquarters - STA 9 – 308 Reed Boulevard in Mill Valley

AGENDA

1. T-Mobile Cell Contract Changes
   The Committee will review Tiburon and Kentfield Fire’s T-Mobile contract to gather the optimum conditions for the amended SMFD T-Mobile contract.

2. STA 4 Tree Removal
   There are four problematic trees at STA 4. The Committee will review the reports from Arbor Day Tree Care dated April 10, 2017 and the 2014 Structural Review and Conditional Assessment reports for a better understanding of the issue.

3. Good of the Committee
Building Committee Meeting
December 22, 2016 – STA 9

MEETING NOTES

Come to Order:  8:37 am
In attendance:  Directors Chun, Hilliard and Perazzo, Battalion Chief Pasquale and ASM Kim

**T-Mobile – Request to Update Cell Tower Equipment at STA 9**
The District received a request from T-Mobile to upgrade their cell tower equipment at Fire Station 9 (STA 9). While processing T-Mobile’s request, BC Pasquale determined immediately that the District cell leases needed to be reviewed to establish which cell equipment lease was current and assigned to what specific cell equipment. Once the organizational review was completed, BC Pasquale contacted T-Mobile to discuss updating the current cell lease and request EMF emission readings on the existing cell equipment at STA 9. BC Pasquale reported to the Building Committee that the current T-Mobile is out of date and needs to be amended to include the cell tower conditions and also, there are no baseline EMF readings for the T-Mobile cell tower at STA 9.

The SMFD Board of Directors developed a set of cell tower conditions that cell phone providers need to in compliance with in order to locate their cell equipment at SMFD fire stations. The conditions were developed to provide EMF emission levels from cell towers to the community and one of the conditions is to establish a baseline EMF for each cell tower. The baseline reading is to ensure that equipment upgrades to cell antennas do not produce significantly higher EMF emissions.

BC Pasquale relayed to T-Mobile that the District cannot consider their requested to upgrade the cell equipment at STA 9 until the cell lease is amended to include the SMFD cell tower conditions and baseline EMF readings are established. In response, T-Mobile stated that the request to upgrade the cell equipment needs to be approved by District before they will amend the cell tower lease and provide baseline EMF readings.

The equipment upgrade will not change height of the tower but includes installing a taller antenna. The Building Committee wants to have public meeting to give the community a chance to weigh in on modifying the cell antennas at STA 9. The District is accountable to the community and as such, needs to provide EMF emission information and also monitor any changes in the EMF emissions.

BC Pasquale stated that the T-Mobile cell equipment upgrade request was a good opportunity for staff to review and organize the cell tower leases. There are cell towers at Fire Stations 4 & 9 with more than one cell provider. Each cell antennae has its own lease and specific conditions. The equipment upgrade request is an opportunity for the District to increase the fee it receives from T-Mobile for cell tower lease. Currently, the District receives $20,000 annually for the T-Mobile cell equipment. The Committee also feels this is an opportunity for District staff to educate cell companies that the District has a duty to the community to disclose EMF emissions and possible safety concerns from EMF emission to the public. Cell companies need to keep accurate EMF records from each cell tower and provide this information to agencies and the public.

The Committee directed BC Pasquale to contact T-Mobile again to inform them that the Committee cannot consider approving their request to upgrade the cell equipment at STA 9 until the current cell lease is amended to include the cell tower conditions and EMF baseline emission levels are established.
**STA 4 Remodel**

BC Pasquale asked if it would be appropriate to allow District staff to do some of the construction work such as painting for the STA 4 remodel. BC Pasquale stated that using District staff that has construction work experience instead of hiring a construction contractor will keep the remodel/construction costs down but acknowledges that compensating a SMFD employee at a lower rate is only beneficial to the District if the work provided by SMFD staff is remains at the highest level. He is also concerned about being in compliance with SB XXXX.

Director Hilliard stated that construction projects under $45,000 are not subject to SB XXXX. The District can also treat each construction need as a single task, and not the entire remodel project as a whole. That would keep all construction needs under the $45,000 threshold and not subject to SB XXX requirement.

BC Pasquale envisions that employee-generated construction would be run through payroll at the normal firefighter salary. Construction tasks would be scheduled during the employees normal work schedule and any OT expenses generated by the construction needs would be included in the STA 4 remodel costs. BC Pasquale would provide a report to summarize the financial savings realized from using SMFD staff instead of general contractors.

The Committee asked staff to confirm that employee-provided construction is covered under the District liability insurance and WC coverage. The Committee also asked BC Pasquale to confer with SMFD legal counsel about allowing employee-generated construction to determine if there is any liability or legal issues.

The approved STA 4 remodel project is mainly to provide unisex bathroom facility and reconfigure the sleeping quarters and locker room. Other considerations for STA 4 remodel include IT upgrade and seismic retrofitting.

**Honor Wall Project**

Director Perazzo asked if there was any work being done on the Honor Walls at the Fire Stations. He explained to the Building Committee that the idea for the Honor Wall originated from the STA 1 crew who suggested establishing one wall at the fire house where people with great contributions to the Fire Service and/or community would be honored. A similar Honor Wall would be located at every fire station and plaques created duplicated at all three stations. The Honor Wall honorees would be determined by District staff as needed.

BC Pasquale said he did not have anything new to report on the Honor Wall but will follow up with staff.

**STA 1 - Meeting Notice Public Access**

The District posts meeting notices at all of the fire stations and Director Hilliard noticed that the meeting agendas notices posted at STA 1 are not visible to the public. Notices are currently posted in a bulletin case in the lobby of STA 1 and not easily accessible because the lobby door is locked. She asked if the bulletin case could be moved to the outside of the building for better public access. ASM Kim shared with the Committee that the City of Sausalito has strict rules for exterior signage. The City should be consulted prior to relocating anything to the outside of STA 1. ASM Kim suggested taping meeting agendas to the front door as an alternative solution. Agendas taped to the front door will allow better public access and not create additional work for District staff that moving the bulletin case would generate.

**Facility Inspections**

Chief Pasquale is hoping to implement facility inspections process for all District facilities in future. Director Perazzo has facility inspection forms for staff use to evaluate building conditions and compliance periodically to provide to SMFD.

Adjourned: 9:47 am
Arborist Report

Date: April 9, 2017

To: Kai Pasquale
309 Poplar Street
Mill Valley, CA 94941

Job Location: 309 Poplar Street, Mill Valley, CA 94941

Activity: Observe and recommend action for a small group of trees in front of the fire station at 309 Poplar Street.

Observations:

When facing the fire station, there is a small group of Coastal Redwood trees (Sequoia sempervirens) to the right of the building and left of the driveway. The group of trees is growing very close to the building and driveway. The trees range in size from 6 inches to 18 inches in diameter and are 25 - 45 feet in height. They are in good health and growing vigorously.

The area where these trees are growing is being damaged by the roots of these fast growing redwoods. As time goes by, the damage will continue to worsen, lifting the pavement and foundation.

Recommendations:

These trees should be removed because this area is much too small for a group of Coastal Redwood trees. The root damage will progress rapidly. There are many other alternative species more suitable to replace these trees for shade and aesthetics.

I've included photos below.

Please feel free to contact me with any questions or concerns.
Regards,

[Signature]

Edgar C. Evans
Certified Arborist WC 0720
Group of Coastal Redwood trees
Crack in driveway from root invasion
Southern Marin Fire Station No. 4
309 Poplar Street
Mill Valley, CA 94941

Tier 1 Structural Review and Conditional Assessment
June 13, 2014

FINAL DRAFT
June 13, 2014
2014038

BRW Architects
1620 Montgomery Street, Suite 320
San Francisco, CA 94111

Attention: Chris Ford

Subject: Southern Marin Fire Station No. 4
Tier 1 Structural Assessment
309 Poplar Street,
Mill Valley, CA 94941

Dear Chris:

Cornerstone Structural Engineering Group is pleased to present this structural assessment report. In accordance with our proposal, we have performed a structural review and seismic risk assessment for the Southern Marin Fire Station No. 4 building. The building is a partial two-story wood framed building with a high bay apparatus constructed in the 1970s.

We completed a site visit on May 12, 2014, and we have reviewed the available structural plans. This review includes a Tier 1 ASCE 31 seismic evaluation for Immediate Occupancy and a conditional assessment of the building. The Tier 1 assessment includes a general review of the vertical and lateral systems of the structure.

The following report describes the findings of our structural review and seismic risk assessment for the building. We have included information on the performance of the building in a code-level earthquake.

Sincerely,

CORNERSTONE STRUCTURAL ENGINEERING GROUP, INC.

Thomas L. Swayne, S.E.
Principal
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PART 1: INTRODUCTION

The following represents a general structural conditional and seismic assessment of the existing Southern Marin Fire Station No. 4 located at 309 Poplar Street in Mill Valley, California. The fire station building is on a flat site and is a partial two-story, wood framed building with two large and two smaller apparatus bays originally constructed in 1974, see photos 1-4. The site also contains a 3-story wood framed hose tower behind the station that was not included in this assessment, see photo 5.

![Southern Marin Fire Station No. 4 Site Plan](image)

_A figure showing the Southern Marin Fire Station No. 4 Site Plan._

A site visit was performed on May 12, 2014 to observe the existing structural conditions of the fire station building.

The report conclusions are limited by the availability of as-built construction documents and by the level of access possible for the observation of the building. This report describes the findings of our structural review, and provides recommendations for seismic upgrade and conditional structural repairs as applicable.
PART 2: SEISMIC PERFORMANCE EVALUATION

2.1 Methodology
The potential damage to a structure in an earthquake can be evaluated provided that, (1) seismic hazards which affect the structure and site can be estimated and, (2) the vulnerability of the structure to those hazards are known or can be estimated.

Seismicity of the fire station was determined using the United States Geologic Survey (USGS) web based Seismic Hazard Curves, Response Parameters and Design Parameters program. Seismic short period Ss and one second S1 response acceleration parameters were obtained using latitude and longitude coordinates of the fire station location.

Seismic evaluation of the building was conducted using the ASCE 31-03 – Seismic Evaluation of Existing Buildings. The ASCE 31 provides a three-tiered process for seismic evaluation of existing buildings based on building type and the level of seismicity for the building location. The Tier 1 study is an initial checklist evaluation of structural, non-structural and foundation/geologic hazard elements of a building and site conditions that is intended to screen for potential seismic deficiencies. Tiers 2 and 3 studies are more in-depth analysis procedures for a building or component that is identified by the Tier 1 screening process as structurally deficient.

This assessment of the fire station building utilizes the Tier 1 screening procedure.

2.2 Performance Level
ASCE 31 evaluation of a building can be performed for either Life Safety (LS) or Immediate Occupancy (IO) performance level.

ASCE 31 generalizes the two performance levels as follows:

- LS Performance Level: At least some margin against either partial or total collapse remains, and that the overall risk of life-threatening injury as a result of structural damage is expected to be low.

- IO Performance Level: After an earthquake, the basic vertical and lateral force-resisting systems retain nearly all of their pre-earthquake strength, very limited damage to structural and non-structural components has occurred and that critical parts of the building are habitable.

The fire station building was evaluated using the Immediate Occupancy (IO) performance level criteria.

2.3 Seismic Source
The general seismicity in the San Francisco Bay Area is influenced by several known faults, their potential faulting length, and relative orientation. The San Andreas Fault system, which separates the North American plate from the Pacific plate, is located approximately 9.1 km west of the fire station. Other known, nearest-site faults with recorded activity, such as the Hayward Fault are listed in Table 1.

Recent earthquakes in Southern and Central California – namely Coalinga, Whittier Narrows, and Northridge – have occurred along blind-thrust faults. These faults do not have readily identifiable surface features and are not extensively mapped. The potential for strong-ground motion to occur due to blind-thrust faulting in Northern California is somewhat in doubt. However, a moderate to large earthquake centered even closer to the site cannot be completely ruled out.
Table 1: Active Near Source Faults

Based on the 2008 USGS mapping, the 475-year peak ground acceleration (PGA) for the site is estimated to be 0.469 g. The 475-year earthquake is the design basis for a standard structure in the California Building Code (CBC) and is based on a 10 percent probability of exceedance within a 50 year time frame.

The calculated site specific $S_{55}$ and $S_{10}$ response acceleration parameters for the fire station building are 0.93g and 1.137g respectively, using a site classification E per USGS Soil Type and Shaking Hazard in the San Francisco Bay Area Map. Based on $S_{55}$ and $S_{10}$ values, ASCE 31 categorizes the seismicity of the building as ‘High.’

2.4 Liquefaction, Landslide, and other Geologic Hazard

Currently published California Geological Survey (CGS) liquefaction hazard zone maps do not include this part of California yet. According to the Association of Bay Area Governments Earthquake Liquefaction Susceptibility maps, the fire station is located within a 'Very High' zone for liquefaction, see Figure 2. Liquefaction is the loss of bearing strength of saturated, cohesionless soils under strong ground motions, which can cause building settlement by consolidation of soils susceptible to liquefaction. Based on the hazard maps and a cursory knowledge of the soils in the area, the potential for liquefaction due to strong ground motions is considered to be high.

The building is situated on a relatively flat site within a developed area. The potential for seismically induced landslide is therefore considered to be minimal. Currently published CGS maps for landslide vulnerability do not include this area yet.

Figure 2: Association of Bay Area Governments Earthquake Liquefaction Susceptibility Map – Very High (Maroon)
The fire station is not located within a Special Study Zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act. The potential for surface fault rupture is considered to be low.

It should be noted that a more thorough explanation of site seismicity, liquefaction and specific faulting hazards should be provided by a geotechnical engineer. The conclusions above rely on general USGS & CGS published data for the San Francisco Bay Area.

PART 3: STRUCTURAL EVALUATION

3.1 Evaluation
An ASCE 31 Tier 1 seismic evaluation of the Southern Marin Fire Station No. 4 was performed using the Immediate Occupancy performance level. The building was evaluated for Basic Structural (Sec. 3.7), Supplemental Structural (Sec. 3.75) and Geologic Site Hazard and Foundation (Sec. 3.8) checklists. This report does not evaluate the building for the Nonstructural (Sec. 3.9) checklist, which is typically performed by an Architect or other qualified professional.

3.2 Documentation
Available record or as-built drawings for the fire station include:

- The structural construction drawings for the fire station building stamped by Geoffrey F. Barrett. Sheet S1-S6 (job number 7422, so likely 1974)
- The architectural construction drawings for the fire station building by Donald K. Olsen AIA Architect. Sheets A1-A21 (same project number)

The information provided within this report regarding the building is based on field observation and review of available as-built drawings.

3.3 Vertical Load System

- Upper roof consists of 3/4 inch plywood over wood gangnail trusses @ 4 feet that span between either 2x4 or 2x6 wood framed bearing walls.
- Lower roofs at the North/South and East/West building extensions are sloping and consist of 1/2 inch plywood over either 2x6, 2x8, or 2x12 roof joists @ 16 inches.
- The roof above the apparatus bay consists of 1-1/8 inch plywood over slightly sloping wood trusses @ 2 feet that span between glulam beams.
- The second floor consists of 1-1/8 inch plywood over flat wood trusses @ 2 feet that span between glulam beams.

3.4 Lateral Load System
Lateral loads acting on the fire station building result from either wind pressure or earthquake-induced inertia forces acting on structural and non-structural elements. Lateral loads acting on the structure are transferred through flexible roof and floor diaphragms to the primary lateral-force resisting system of the structure. The primary lateral-force resisting system consists of plywood sheathed wood shear walls which transfer lateral loads down to the continuous reinforced concrete spread footings.
3.5 Conditional Review
Based on our review, the fire station building appears to be in general compliance with the codes and standard construction practices in effect at the time of their construction. The exterior, interior, and portions of the roof of the fire station were observed during the site visit on May 12, 2014. Based on our cursory observations, the building appears to be in overall good condition, except for the following specific conditions as noted (see Appendix for photos referenced):

- Spalling, cracking, and differential settlement of the approach slab at the interface with the apparatus bay slab. (See Photos 6 & 7)
- Minor water damage to window header in the apparatus bay. (See Photo 8)
- Cracking and tree root damage to site paving throughout site. (See Photo 9)
- Minor water damage to roof eave. (See Photo 10)

3.6 Seismic Evaluation Findings
Based on the ASCE 31 Tier 1 review, the following items are of significance for the performance of the building when subjected to strong ground motions during an earthquake.

Positive Features
- Low rise wood framed structures are relatively lightweight and historically perform well in seismic events.
- Wood sill plates are bolted to the foundation and within the allowable 4 foot spacing.
- All chord elements are continuous. Wood posts have a positive connection to the foundation.
- Diaphragms consist of wood structural panels (and appear to be blocked) and are within the allowable spans and aspect ratios.
- Wood glulams beams have a positive connection to wood posts.
- Perimeter foundations show little to no signs of significant settlement or distress.

Negative Features
- The longitudinal shear walls at the first floor appear to be overstressed per the allowable limits within the Tier 1 evaluation.
- Shear walls do not appear to have hold-down anchors to the foundation.
- Several shear walls at the second floor are discontinuous and do not extend down to the foundation.
- Shear walls do not appear to have interconnection between the first and second stories capable of transferring overturning and shear forces through the floors to shear walls below.
- There exists a split-level diaphragm between the second floor and the low roof above the apparatus bay. This effectively splits the building in two parts and presents vulnerability for separation at this joint where the floor step occurs.
- The building extensions from the apparatus bays and turnout bay are torsionally irregular. This kind of unbalanced loading can lead to amplified rotational deflections and concentrated forces at the attachment point to the main building during a seismic event. Furthermore, there does not appear to be an
PART 4: CONCLUSION AND RECOMMENDATIONS

4.1 Expected Performance
Findings within this report provide a general structural conditional and seismic assessment of the existing building of the Southern Marin Fire Station No. 4 located at 309 Poplar Street in Mill Valley, CA. Our evaluation concludes that the building fails to meet full compliance for ASCE 31 Tier 1 Immediate Occupancy performance criteria.

The following structural relative performance descriptions are based on our professional engineering judgment and experience, and are not part of the ASCE 31 Tier 1 checklist. These descriptions are included to provide a general estimation of seismic performance of the structure, based on component evaluations provided by the Tier 1 evaluation procedure. We expect the building to perform as follows:

- The building is anticipated to perform below average in comparison to buildings of similar construction when subjected to a design level earthquake, due to overstressed shear walls, discontinuous shear walls, lack of hold downs, and torsional irregularities.

4.2 General Recommendation for Conditional Issues
The following recommendations are provided to address issues concerning the condition of the existing fire station building. While none of these represent immediate life safety issues; it is recommended that these issues be addressed in the near future to prevent further deterioration from occurring:

- There is cracked concrete and exposed reinforcement where the approach slab meets the apparatus bay slab. Continuous reinforcing occurs between the interior and exterior slabs at this location. Chip out existing approach slab at this interface and reconfigure connection detail to eliminate reinforcement across this plane and allow differential movement.
- Replace portion of damaged roof eave and provide waterproofing around root eave corner.
- Replace tree roots and replace site paving. Alternatively, replace and reconfigure site paving system to accommodate tree roots.
4.3 Seismic Recommendations

The following qualitative recommendations are provided to address our opinion of the potential remediation options for identified seismic deficiencies. These methods are based on our evaluations described elsewhere in this report and engineering judgment. While the recommendations listed below do not represent any immediate concerns that warrant facility closure, they do describe building components that are non-compliant per the ASCE 31 Tier 1 checklist review for Immediate Occupancy performance or as identified by conditional or systemic deficiencies. We recommend these repairs and seismic upgrades are programmed into a future project:

- Install new hold-downs and potentially new footing supplements at existing shear walls at the ground floor slab/foundation level;
- Install new longitudinal steel moment frames at the first floor apparatus bay openings to laterally support these open sides;
- Enhance the existing plywood shear walls as necessary to make up for deficient shear capacity;
- Install straps between first and second story shear walls to provide interstory continuity;
- Provide support beams for hold downs at discontinuous second story walls. These beams are necessary to resist overturning (hold-down) forces from the ends of upper level shear walls where they do not continue to the foundation;
- Provide a collector tie at shear wall lines along the second floor and apparatus bay low roof interface to provide continuity across the split-level diaphragms so that seismic load can be delivered to shear walls as they occur;
- Provide straps at the apparatus bay side walls and turnout bay side walls to anchor these freely rotating elements back into the low roof or floor diaphragms.
PART 5: APPENDIX - PHOTOS

Photo 1: Northwest Corner of Building.

Photo 2: Northeast Corner of Building.
Photo 3: Southeast Corner of Building.

Photo 4: Southwest Corner of Building.
Photo 5: Hose Tower (Not Included In Assessment).
Photo 6: Cracking and exposed reinforcement in the Approach Slab.

Photo 7: Differential Settlement between the Approach Slab and the Apparatus Bay Slab.
Photo 8: Minor water damage at window header.

Photo 9: Cracking and Tree Root Damage to Site Paving.
Photo 10: Minor Water Damage at Roof Eave.