APPROVED
OCT 21 2021
BOARD OF RECREATION
AND PARK COMMISSIONERS

BOARD REPORT **NO.** 21-178

DATE October 21, 2021 C.D. 4

BOARD OF RECREATION AND PARK COMMISSIONERS

SUBJECT: GRIFFITH PARK – LA SHARES BUILDING DEMOLITION (PRJ21500) PROJECT – COMMITMENT OF PARK FEES – STATUTORY EXEMPTION FROM THE PROVISIONS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) PURSUANT TO PUBLIC RESOURCES CODE SECTION 21080(b)(4) AS A SPECIFIC ACTION NECESSARY TO PREVENT OR MITIGATE AN EMERGENCY

AP Diaz	________	M. Rudnick	________
H. Fujita	________	for C. Santo Domingo	DF
J. Kim	________	N. Williams	________

M. Shull
General Manager

Approved X Disapproved ________ Withdrawn ________

RECOMMENDATIONS

1. Approve the scope of work of the Griffith Park - LA Shares Building Demolition (PRJ21500) Project (Project), as described in the Summary of this Report;

2. Authorize Department of Recreation and Parks (RAP) staff to commit from the following fund and work order numbers, a maximum of Four-Hundred Thousand Dollars ($400,000.00) in Park Fees, for the proposed Project;

FUNDING SOURCE	FUND/DEPT./ACCT. NO.	WORK ORDER NO.
Park Fees	302/89/89718H	QZ900160
Park Fees	302/89/89716H	QT067577

3. Approve the proposed Project to be bid and constructed through RAP's list of pre-qualified on-call contractors;

4. Approve the authorization of change orders as authorized under Board Report #No. 06-136, for the construction contracts for this Project in the budget contingency amounts for such construction contracts as set forth in this Report;

5. Determine that the project is statutorily exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Public Resources Code Section

21080(b)(4) as a specific action necessary to prevent or mitigate an emergency and direct RAP staff to file a Notice of Exemption (NOE) with the Los Angeles County Clerk;

6. Authorize RAP's Chief Accounting Employee to prepare a check to the Los Angeles County Clerk in the amount of $75.00 for the purpose of filing an NOE; and,

7. Authorize RAP staff to make technical corrections as necessary to carry out the intent of this Report.

SUMMARY

Griffith Park is located at 4730 Crystal Springs Drive in the Hollywood community of the City. This 4,281.73-acre park provides a variety of recreational programs and activities for the local community. Due to the size of the park, and the facilities, features, programs, and services it provides, Griffith Park meets the standards for a Regional park, as defined in the City's Public Recreation Plan.

PROJECT SCOPE

The LA Shares building is located at 3210 Riverside Drive in Griffith Park. This building was built in the early 1960's and once served as the Costume Workshop for the Griffith Park Children's Theater. For many years the building has been occupied by L.A. SHARES, a nonprofit material reuse program that receives donations of reusable goods and materials and redistributes them free-of-charge to nonprofits and schools throughout the City. The building was damaged by fires that occurred in August 2020 and in September 2021.

The proposed Project includes the following scope of work items:

- Abatement and demolition of the fire damaged LA Shares building.
- Additional site work.
- Installation of new landscaping to replace the building site.

PROJECT FUNDING

Upon approval of this Report, Four-Hundred Thousand Dollars ($400,000) in Park Fees can be committed to the proposed Project.

The anticipated pre-qualified on-call contracts for this Project will be for Park Facility Construction. The budget contingency for the Park Facility Construction contracts will be Forty Thousand Dollars ($40,000.00).

These Park Fees were collected within ten (10) miles of Griffith Park, which is the standard distance for the commitment of the Park Fees for regional recreational facilities pursuant to Los Angeles Municipal Code Section 12.33 E.3.

FUNDING SOURCE MATRIX

Source	Fund/Dept/Acct	Amount	Percentage
Park Fees	302/89/89718H	$48,266.36	12%
Park Fees	302/89/89716H	$351,733.64	88%
Total		$400,000.00	100%

PROJECT CONSTRUCTION

RAP Staff has determined that sufficient funding has been identified and the proposed Project is anticipated to begin in Fall 2021.

TREES AND SHADE

The proposed Project will have no impact on existing trees and shade at the park.

ENVIRONMENTAL IMPACT

The proposed project consists of the demolition of an existing building damaged by fires that occurred on August 20, 2020, September 14, 2021, and September 16, 2021 and the installation of new landscaping.

According to the attached Structural and Fire Assessment report (Attachment 2), this existing building cannot be feasibly repaired, reused, or rehabilitated. Since the structure was built in the 1960's, the structure is not likely to meet the current code requirements specifically for vertical and seismic lateral analyses. Therefore, the existing undamaged portions are not acceptable for today's building code. Because of the excessive fire damage in addition to termite dry rot damage, most of the building components are structurally compromised and will need to be demolished due to safety concerns.

Public Resources Code (PRC) section 21080(b)(4) provides that CEQA does not apply, to "specific actions necessary to prevent or mitigate an emergency." PRC section 21060.3 defines *emergency* as "a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services." Section 21060.3 further provides that *emergency*, "includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage."

The proposed project is an action that both prevents and mitigates an emergency. In fact, by demolishing an unsafe building that could collapse on park patrons, is a specific action necessary to prevent an emergency. Further, it mitigates the effects of multiple emergencies, the multiple fires that occurred on August 20, 2020, September 14, 2021, and September 16, 2021 which compromised the structures of the building.

Therefore, staff recommends that the Board of Recreation and Park Commissioners (Board) determine that this Project is statutorily exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Public Resources Code Section 21080(b)(4) as a specific action necessary to prevent or mitigate an emergency. Staff will file a NOE with the Los Angeles County Clerk upon the Board's approval.

FISCAL IMPACT

The approval of the commitment of Park Fees will have no fiscal impact on RAP's General Fund.

The estimated costs for the actions listed in the Project Scope section of this report are anticipated to be funded by Park Fees or funding sources other than the RAP's General Fund. The maintenance of the proposed park improvements can be performed by current staff with minimal impact to existing maintenance service at this facility.

STRATEGIC PLAN INITIATIVES AND GOALS

Approval of this Board Report advances RAP's Strategic Plan by supporting:

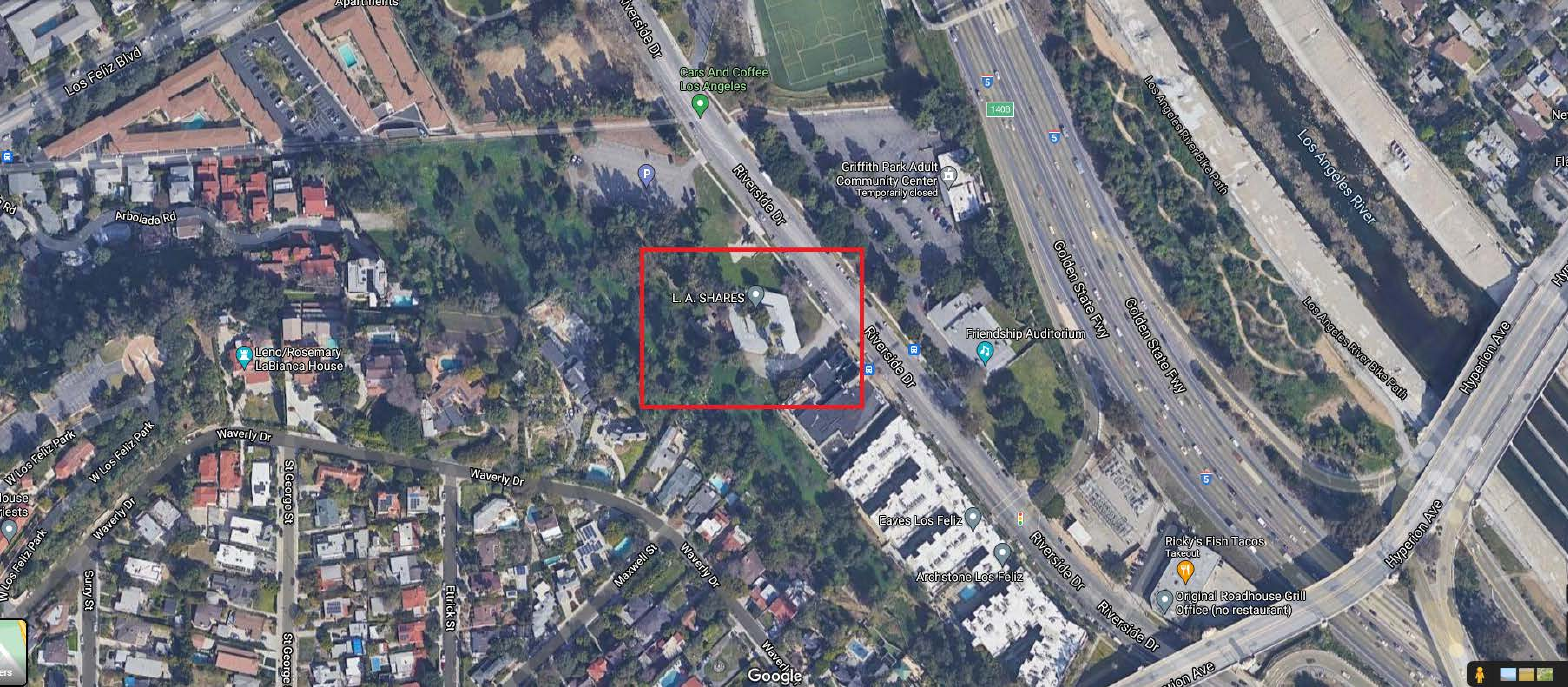
Goal No. 1: Provide Safe and Accessible Parks
Outcome No. 2: All parks are safe and welcoming

Result: The demolition of the fire damaged LA Shares Building will increase safety and enhance the park users' experience.

This report was prepared by Ajmal Noorzayee, Management Assistant, Planning, Maintenance and Construction Branch.

LIST OF ATTACHMENTS

1) Map of location of LA Shares Building
2) Structural and Fire Assessment



Los Feliz Blvd
Arbolada Rd
Riverside Dr
Cars And Coffee Los Angeles
Griffith Park Adult Community Center
Temporarily closed
L. A. SHARES
Friendship Auditorium
Leno/Rosemary LaBianca House
Golden State Fwy
Los Angeles River
Los Angeles River Bike Path
Hyperion Ave
Waverly Dr
W Los Feliz Park
St George St
Maxwell St
Ettrick St
Surry St
Eaves Los Feliz
Archstone Los Feliz
Ricky's Fish Tacos
Takeout
Original Roadhouse Grill Office (no restaurant)
140B
5
Google

Technical Memorandum

Date:	October 11, 2021
To:	Elena Maggioni, City of Los Angeles, Department of Recreation and Parks
From:	Victor Ramirez, SE – Tetra Tech, Geoffrey Heinen, EIT – Tetra Tech, Alexis Bahou, PE (Tetra Tech)
Project: LA SHARE Building	***Project Number:*** 112G-SBA-T41752
Subject: Structural And Fire Assessment	

INTRODUCTION

The City of Los Angeles, Department of Recreation and Parks (RAP), received a Notice of Violation from the City of Los Angeles Department of Building and Safety (LADBS) on September 17, 2021. The Notice was regarding an abandoned office building located at 3224 Riverside Drive, near the Griffith Park. This existing structure is an old RAP office that was heavily damaged by three fires within the last few years. RAP requested that Tetra Tech perform a structural and fire assessment of the existing building. The goal of the assessment was to determine whether the structure could be repaired and rehabilitated, or whether the building should be demolished due to safety hazard. The structure is currently red-tagged and is closed off to the public by the LADBS. RAP contracted Tetra Tech to perform a visual inspection and determine the structural integrity of the building. Therefore, this Technical Memorandum has been prepared to describe the current condition of the building, include preliminary structural calculations, and recommend either demolition or replacement.

BACKGROUND

The existing structure was built in the early 1960's for RAP to be near Griffith Park. The structure was occupied for many years before the 2020 pandemic. The structure is also included as a historical character-defining feature/contributing within the Historic-Cultural Monument (HCM) determination for Griffith Park. The roof of the structure has wood sheathing and framing and wood columns and bearing walls designed to support the roof. The structure contains multiple structural wood shear walls that act as the main seismic load resisting system. The existing building was damaged by fires that occurred on August 20, 2020, September 14, 2021, and September 16, 2021. As a result, the structure has been closed (red-tagged) until a structural and fire assessment could be performed under the direction of RAP.

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STRUCTURAL AND FIRE ASSESSMENT

Prior to the structural assessment, a Health and Safety Plan was prepared to cover emergency situations that might arise during the field investigation. On October 28, 2021, Geoff Heinen, a structural engineering designer, and Eric Hutchins, a Health Safety Officer, of Tetra Tech performed a structural assessment of existing building. During the field work, it was observed that RAP was able to create clear paths/walkways as part of hazardous building material abatement activities which allowed access to portions of the building while minimizing safety concerns.

During the structural assessment, Tetra Tech located the likely origin of the fire and its path due to the amount of damage inside. The ignition point started on the western side and spread to the eastern side of the existing building. This is evident from the extensive fire damage on the western side versus the eastern side of the building. The western side was completely burned while the eastern side was scarred by smoke. The fire traveled throughout the structure by the existing wooden roof. Old dry wood is an excellent fuel for fires especially in warmer climates. During the site visit, Tetra Tech provided a photo log to document any damaged structural components (See Appendix 1).

The roof and its columns were the only exposed structural components that were heavily damaged by these fires. Most of the building was protected by the fire-protected cementitious-material boards which are attached to the bearing walls. By observation, these cementitious-material boards prevented the entire structure from burning down and cause collapse (See Photo 40, 41 and 42). During the site visit, Tetra Tech examined critical structural components of the building. These structural components included the roof framing, columns, bearing walls and floor framing. As-built drawings were not available; therefore, Tetra Tech measured and recorded the dimensions, height and spacings of structural components which provided sufficient information to perform a limited structural analysis. An evaluation of each one of these structural components and the limited structural analysis is further described below.

- Tetra Tech visually inspected and assessed the current conditions of the existing wooden roof planks and beams. By observation, most of existing roof was heavily damaged from these fires especially on the western side of the building (See Photos 22 and 23). The existing roof components include asphaltic roof tiles, microfiber sheets, plywood and 2x5 wood planks. These roof components were supported by 4x10 wood beams which are the main support beams in the building. All these components are seen in each section of the building. Therefore, this is a typical design concept within this building. On the western side and center of the building, the surfaces of these wood planks and beams were heavily burnt. Additionally, there is evidence of termite damage within these planks and beams which further affects the structural integrity of the roof (See Photo 28). On the eastern side, the roof was not as heavily burnt but scarred to a dark gray color from the smoke. Like the western side, there is evidence of termite damage due to the wood fibers falling from the roof (See Photo 21). Because of the abandonment of this building and unknown structure maintenance, the termite damage may be much worse than what was observed in the field.

  To further evaluate the current roof condition, preliminary structural calculations were completed to determine the wood plank and beam capacities before and after the fire. These structural calculations are included in this memo (See Appendix 2). When fire burns wooden structural components, the wood is either completely or partially burned. When the wood components are partially burned, structural members are reduced in size and load bearing capacity. During roof examination, there is evidence that the wood was partially burned by the fire. This evidence can be seen by how the burned beams are preventing the existing roof from collapsing completely. Due to safety concerns, Tetra Tech was not able to spot check for dry rot or determine the burnt thickness using steel probes on the wood roof planks and beams. Therefore, these calculations assume at a $^{1}/_{2}$-inch of wood was partially burnt and indicate the roof support's capacity has been reduced to the point that workers cannot safely stand on the roof top due to the risk of collapse. The roof had collapsed in three areas of the building as observed on the western side (See Photo 45). Because of the reduced capacity of the structure, it is likely the roof will collapse due to its own weight, wind loads, or additional weight from rainwater. Therefore, the roof wood structural components will need to be demolished because of the high possibility of collapse.

- After the examining the roof, Tetra Tech visually inspected and assessed the current conditions of the existing wooden columns. Like the roof, the fire damage occurred mainly on the western side and then decreased on the eastern side. The columns have a 4” x 4” square shape and are spaced 47-inches throughout the building. These columns supported the vertical loads from the roof. Because of the fire, the size of columns and the associated axil capacity for each column member have been reduced. Due to safety reasons, Tetra Tech was not able to spot check for dry rot or determine the burnt thickness using steel probes on the columns. According to the current wood design and construction code, all structural members must meet a specific slenderness ratio to withstand buckling pressures. This slenderness ratio is critical because it prevents the structural member from having local fractures along its segment due to axial loading. Since the fire reduced the size of the columns, these existing columns will not meet this code requirement. On the eastern side of the building, the columns appeared to be in good condition but are scarred to a dark gray color from the smoke (See Photo 20). On the western side and center of the building, the columns were heavily damaged and have a charcoal-like texture. Tetra Tech found areas where there are missing structural columns, columns with missing segments, and columns with major structural cracks especially on the western side of the building (See Photos 43 and 47). These columns are extremely concerning because they increase the possibility of large roof sections collapsing. Therefore, all columns will need to be demolished because of the high possibility of collapse.

- The other vertical support system of the building includes the wooden bearing walls. Like the columns, these bearing walls are spaced evenly throughout the building, but they are less frequent than the columns. These walls are a system of multiple vertical posts and horizontal purlins. This system is used to transfer all vertical loading to the concrete foundation. These bearing walls also act to resist seismic shear. The shear walls were identified by the nails and fasteners that connect to the roof (See Photo 24) and by the anchored hold-down that connects the shear walls to the concrete foundation (See Photo 37). Due to the age of the building, it is most likely that the existing structure does not meet today’s seismic code requirements. Because of this, Tetra Tech did not perform a limited seismic analysis of the structure. However, these walls are critical to the structural integrity in a seismic event. In the areas where the fire was less excessive, the walls are in good condition due the surrounding cementitious-material boards and their distance from the source of the fire (See Photo 35 and 38). In the areas where the fire was excessive, the cementitious-material boards were unable to protect bearing walls (See Photo 32 and 44). Like the columns, the structural members within the wall have a size reduction in capacity due to the fire. Because this structure is a roof wood flexible diaphragm, these shear walls will resist seismic loads due to the tributary weight of the roof. If one of the resistant members is compromised, the adjacent shear walls will need to resist more seismic load than anticipated due the increased tributary width. Because of this, the seismic demand may exceed the allowable capacities of the remaining shear walls.

  Another critical portion of this seismic resistance is the shear transfer connection between the roof and wall. The purpose of this shear transfer is to translate all seismic loading due to roof and columns to the main seismic lateral resisting system which are the existing shear walls. During the site visit, the shear transfer fasteners appear to be in good condition. However, they will not adequately transfer the seismic load because of the burnt portions of the wood. The existing building’s connection are connected by nails embedded into the wood. Since the fire reduced the size of these wood members, the embedded lengths of the nails are shortened. Because of this, the nail and fastener capacities are reduced and will make the shear transfer connection nonexistent. Therefore, the damaged bearing walls will need to be demolish due to a reduction in capacity and non-compliance with current code requirements.

- After examining the walls, Tetra Tech found that the exterior rooms have a raised wooden floor supported by wooden beams which extend outside of the building (See Photo 12). These raised floors appeared to be elevated 1-foot maximum above the existing concrete surface (See Photo 16). As-built drawings were not available; therefore, the true elevation of the raised floor from the concrete surface is unknown. The floor material was determined using a tapping technique with a hammer. Tapping on a concrete slab will make a quick and dull sound while a wood platform will make a hollow sound. Tetra Tech could not fully assess the conditions of the wood floor due to the debris covering the floor and safety hazards. However, a structural assessment was performed of the raised floor support beams extending outside of the building. By observation, these beams show evidence of termite damage and dry rot due to years of outside exposure. During the examination, some of the beams were completely rotted away (See Photos 13 and 14). If further termite damage and dry rot occurs, the beams will continue to lose load bearing capacity and possibly cause floor collapse. Due to access limitations, Tetra Tech does not know if fire damage occurred under the raised floor. However, like the wood roof, the raised floor was exposed with no additional fire protections. Therefore, it is likely the raised floor and its supports are structurally compromised and must be demolished due a lack of structural integrity.

Based on the completed structural and fire assessment, Tetra Tech concludes that this existing building cannot be feasibly repaired, reused, or rehabilitated. Since the structure was built in the 1960's, the structure is not likely to meet the current code requirements specifically for vertical and seismic lateral analyses. Therefore, the existing undamaged portions are not be acceptable for today's building code. Because of the excessive fire damage in addition to termite dry rot damage, most of the building components are structurally compromised and will need to be demolish due to safety concerns. Because of these concerns, Tetra Tech recommends RAP demolish the existing structure.

Appendix 1

PHOTOGRAPH LOG

Photo 1: Exterior Western Portion of Building

Photo 2: Exterior Western Portion of Building

Photo 3: Rotting Wood Beam of Raised Floor On Western Portion of Building

Date:	Project #:	Project:	
03/18/2021	112G-SBA-T41752	LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 4: Existing Hole at Bottom of Building.

Photo 5: Rotting Wood Beams for Raise Floor

Photo 6: Rotting Wood Beams for Raise Floor

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 7: Exterior Eastern Portion of Building w/ Burned Rooftop

Photo 8: Rotting Wood Beam of Raised Floor On Western Portion of Building

Photo 9: Burned Rooftop

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 10: Rotten Wood Beam for Raised Floor

Photo 11: Exterior Portion of Building

Photo 12: Exterior Eastern Portion of Building w/ Rotten Wooden Beams

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 13: Rotten Wood Beam

Photo 14: Burned Wood Joist for Raised Floor

Photo 15: Exterior Eastern Portion of Building

PHOTOGRAPH LOG

Photo 16: Exterior Supports of Raised Floor

Photo 17: Burned Rooftop and Framing

Photo 18: Burned Posts in Rooftop

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 19: Smoked-Scarred Room

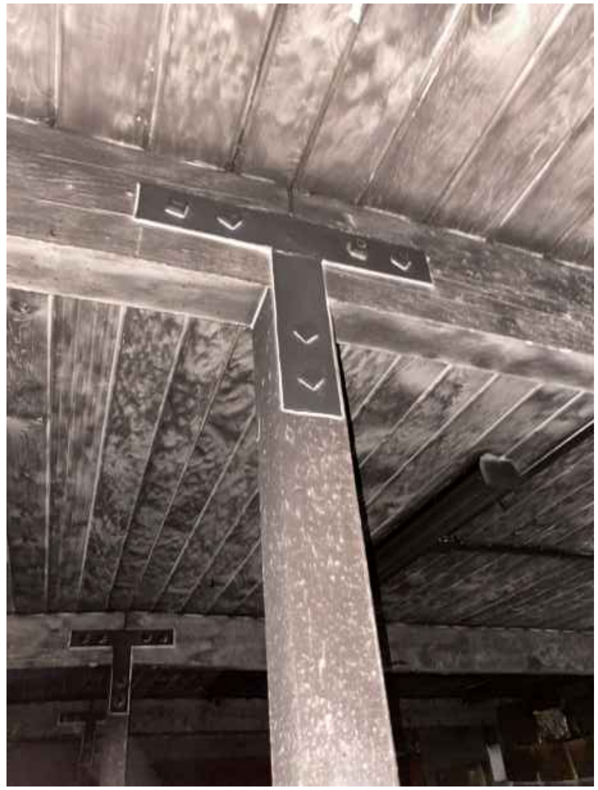


Photo 20: Typical Beam to Column Connection

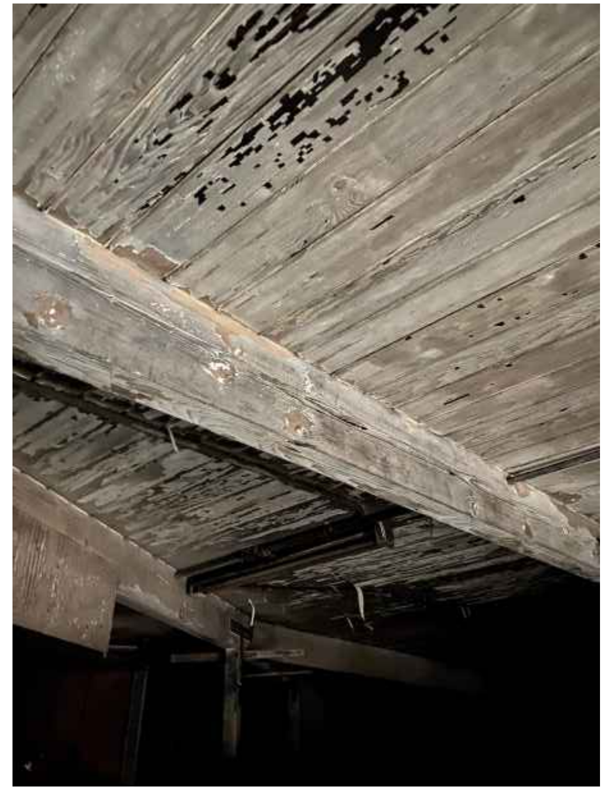


Photo 21: Typical Wood Beam

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 22: Burned Roof and Beams

Photo 23: Burned Interior Column

Photo 24: Shear Transfer from Roof to Shear Wall

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 25: Burned Interior Columns at Western Side

Photo 26: Beam to Column Connection

Photo 27: Burned Interior Columns at Western Side

PHOTOGRAPH LOG

Photo 28: Interior Column and Beam w/ Size Reduction

Photo 29: Burned Beams at Building Center

Photo 30: Burned Interior Columns at Building Center

Date:	Project #:	Project:	
03/18/2021	112G-SBA-T41752	LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 31: Interior Bearing / Shear Wall

Photo 32: Damaged Portion of Bearing / Shear Wall

Photo 33: Burned Gypsum Board on Wall

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 34: Burned Post of Shear Wall

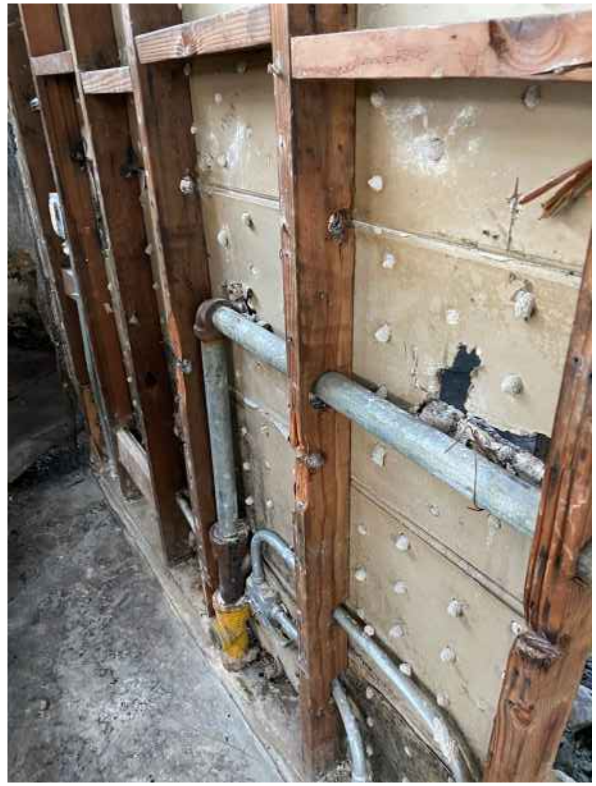


Photo 35: Exposed Portion of Wall w/ Termite Damage

Photo 36: Typical Interior Bearing / Shear Wall

PHOTOGRAPH LOG

Photo 37: Typical Hold-down Seismic Connection

Photo 38: Undamaged Bearing / Shear Wall

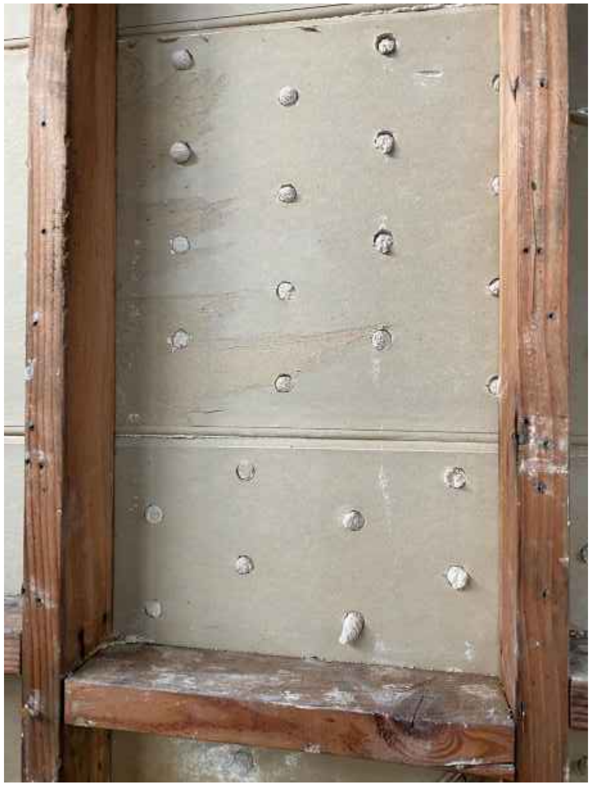


Photo 39: Gypsum Board Interior

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG


Photo 40: Coating Spalling due to Fire


Photo 41: Coating Spalling due to Fire


Photo 42: Coating Spalling due to Fire

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

PHOTOGRAPH LOG

Photo 43: Cracked Interior Column due to Fire

Photo 44: Heavily Burned Interior Support Wall

Photo 45: Roof Opening due to Collapse

PHOTOGRAPH LOG

Photo 46: Burned Interior Wall Post

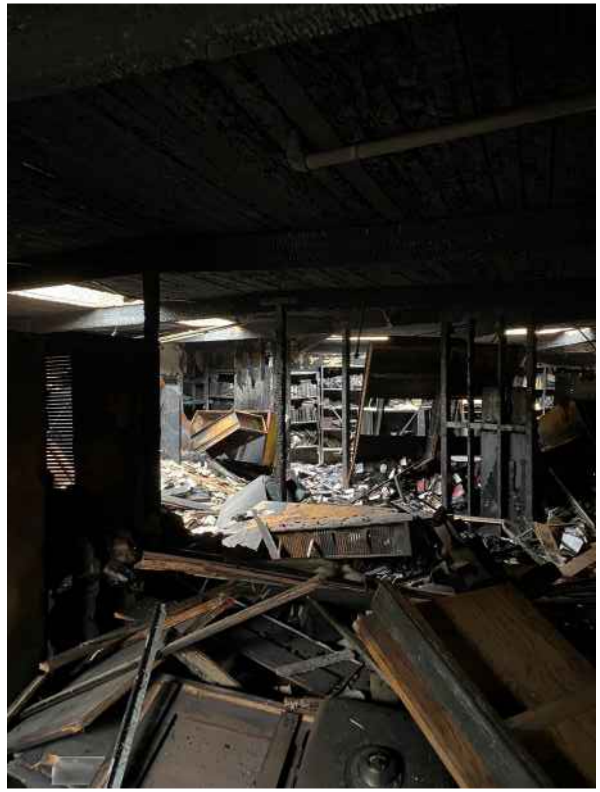


Photo 47: View of Most-Compromised Building Section

Photo 48: Damaged Portion of Wall

Date: 03/18/2021	Project #: 112G-SBA-T41752	Project: LA SHARE Building	TETRA TECH

Appendix 2

Wood Beam

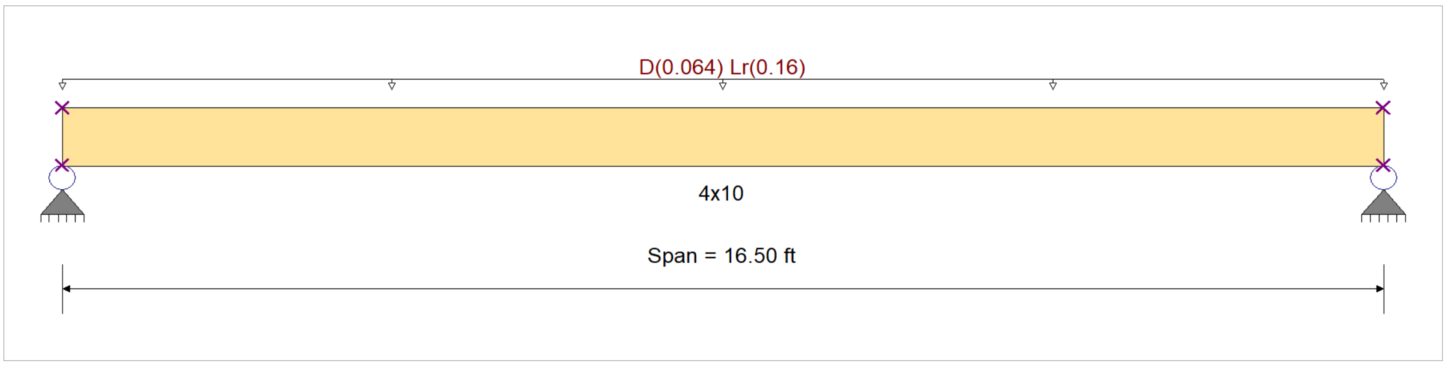
DESCRIPTION: Typical Roof Beam (Before Fire)

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	1,500.0 psi	*E : Modulus of Elasticity*	
Load Combination :	ASCE 7-16	Fb -	1,500.0 psi	Ebend- xx	1,900.0 ksi
		Fc - Prll	1,700.0 psi	Eminbend - xx	690.0 ksi
Wood Species	: Douglas Fir-Larch	Fc - Perp	625.0 psi		
Wood Grade	: Select Structural	Fv	180.0 psi		
		Ft	1,000.0 psi	Density	31.210 pcf
Beam Bracing	: Completely Unbraced				



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0080, Lr = 0.020 ksf, Tributary Width = 8.0 ft, (DL + LL)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	**0.900** : 1	Maximum Shear Stress Ratio	=	**0.347** : 1
Section used for this span		**4x10**	Section used for this span		**4x10**
fb: Actual	=	1,832.77 psi	fv: Actual	=	78.12 psi
Fb: Allowable	=	2,036.82 psi	Fv: Allowable	=	225.00 psi
Load Combination		+D+Lr+H	Load Combination		+D+Lr+H
Location of maximum on span	=	8.250 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.612 in	Ratio =	323 >=180
Max Upward Transient Deflection	0.000 in	Ratio =	0 <180
Max Downward Total Deflection	0.857 in	Ratio =	231 >=120
Max Upward Total Deflection	0.000 in	Ratio =	0 <120

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios									Moment Values			Shear Values		
Segment Length	Span #	M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	M	fb	F'b	V	fv	F'v
+D+H													0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.340	0.138	0.90	1.200	1.00	1.00	1.00	1.00	0.95	2.18	523.65	1539.42	0.48	22.32	162.00
+D+L+H					1.200	1.00	1.00	1.00	1.00	0.95			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.310	0.124	1.00	1.200	1.00	1.00	1.00	1.00	0.94	2.18	523.65	1691.49	0.48	22.32	180.00
+D+Lr+H					1.200	1.00	1.00	1.00	1.00	0.94			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.900	0.347	1.25	1.200	1.00	1.00	1.00	1.00	0.91	7.62	1,832.77	2036.82	1.69	78.12	225.00
+D+S+H					1.200	1.00	1.00	1.00	1.00	0.91			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.275	0.108	1.15	1.200	1.00	1.00	1.00	1.00	0.92	2.18	523.65	1905.58	0.48	22.32	207.00
+D+0.750Lr+0.750L+H					1.200	1.00	1.00	1.00	1.00	0.92			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.739	0.285	1.25	1.200	1.00	1.00	1.00	1.00	0.91	6.26	1,505.49	2036.82	1.39	64.17	225.00
+D+0.750L+0.750S+H					1.200	1.00	1.00	1.00	1.00	0.91			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.275	0.108	1.15	1.200	1.00	1.00	1.00	1.00	0.92	2.18	523.65	1905.58	0.48	22.32	207.00
+D+0.60W+H					1.200	1.00	1.00	1.00	1.00	0.92			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.218	0.078	1.60	1.200	1.00	1.00	1.00	1.00	0.83	2.18	523.65	2403.56	0.48	22.32	288.00

DESCRIPTION: Typical Roof Beam (Before Fire)

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	Moment Values M	Moment Values fb	Moment Values F'b	Shear Values V	Shear Values fv	Shear Values F'v
+D+0.750Lr+0.750L+0.450W+H					1.200	1.00	1.00	1.00	1.00	0.83			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.626	0.223	1.60	1.200	1.00	1.00	1.00	1.00	0.83	6.26	1,505.49	2403.56	1.39	64.17	288.00
+D+0.750L+0.750S+0.450W+H					1.200	1.00	1.00	1.00	1.00	0.83			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.218	0.078	1.60	1.200	1.00	1.00	1.00	1.00	0.83	2.18	523.65	2403.56	0.48	22.32	288.00
+0.60D+0.60W+0.60H					1.200	1.00	1.00	1.00	1.00	0.83			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.131	0.047	1.60	1.200	1.00	1.00	1.00	1.00	0.83	1.31	314.19	2403.56	0.29	13.39	288.00
+D+0.70E+0.60H					1.200	1.00	1.00	1.00	1.00	0.83			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.218	0.078	1.60	1.200	1.00	1.00	1.00	1.00	0.83	2.18	523.65	2403.56	0.48	22.32	288.00
+D+0.750L+0.750S+0.5250E+H					1.200	1.00	1.00	1.00	1.00	0.83			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.218	0.078	1.60	1.200	1.00	1.00	1.00	1.00	0.83	2.18	523.65	2403.56	0.48	22.32	288.00
+0.60D+0.70E+H					1.200	1.00	1.00	1.00	1.00	0.83			0.00	0.00	0.00	0.00
Length = 16.50 ft	1	0.131	0.047	1.60	1.200	1.00	1.00	1.00	1.00	0.83	1.31	314.19	2403.56	0.29	13.39	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr+H	1	0.8567	8.310		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.848	1.848
Overall MINimum	1.320	1.320
+D+H	0.528	0.528
+D+L+H	0.528	0.528
+D+Lr+H	1.848	1.848
+D+S+H	0.528	0.528
+D+0.750Lr+0.750L+H	1.518	1.518
+D+0.750L+0.750S+H	0.528	0.528
+D+0.60W+H	0.528	0.528
+D+0.750Lr+0.750L+0.450W+H	1.518	1.518
+D+0.750L+0.750S+0.450W+H	0.528	0.528
+0.60D+0.60W+0.60H	0.317	0.317
+D+0.70E+0.60H	0.528	0.528
+D+0.750L+0.750S+0.5250E+H	0.528	0.528
+0.60D+0.70E+H	0.317	0.317
D Only	0.528	0.528
Lr Only	1.320	1.320
H Only		

Wood Beam

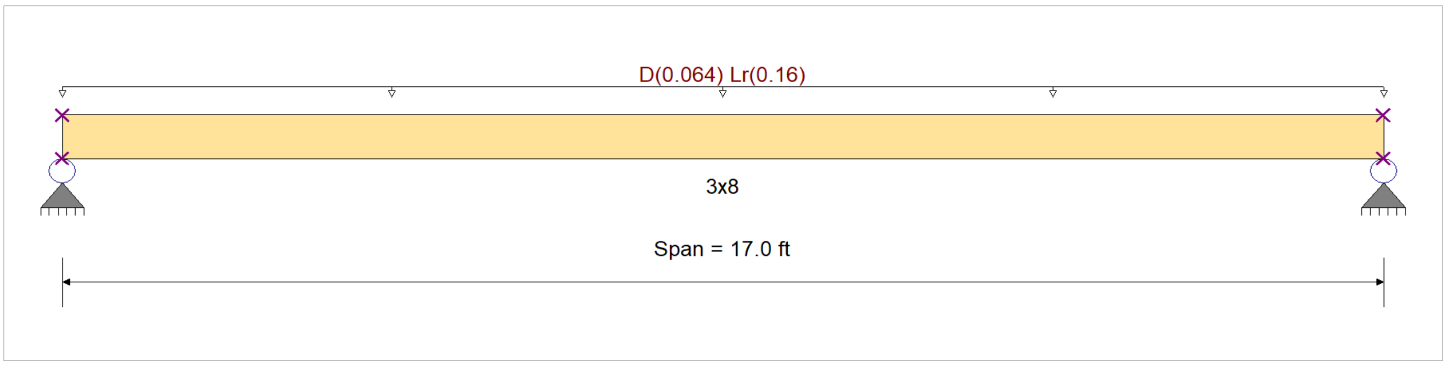
DESCRIPTION: Typical Roof Beam (After Fire) - Assuming 1/2" from all sizes are burned off.

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	1,500.0 psi	*E : Modulus of Elasticity*	
Load Combination :	ASCE 7-16	Fb -	1,500.0 psi	Ebend- xx	1,900.0 ksi
		Fc - Prll	1,700.0 psi	Eminbend - xx	690.0 ksi
Wood Species	: Douglas Fir-Larch	Fc - Perp	625.0 psi		
Wood Grade	: Select Structural	Fv	180.0 psi		
		Ft	1,000.0 psi	Density	31.210 pcf
Beam Bracing	: Completely Unbraced				



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0080, Lr = 0.020 ksf, Tributary Width = 8.0 ft, (DL +)

DESIGN SUMMARY

Design N.G.

Maximum Bending Stress Ratio	=	**2.663** : 1	Maximum Shear Stress Ratio	=	**0.654** : 1
Section used for this span		**3x8**	Section used for this span		**3x8**
fb: Actual	=	4,433.76 psi	fv: Actual	=	147.22 psi
Fb: Allowable	=	1,664.81 psi	Fv: Allowable	=	225.00 psi
Load Combination		+D+Lr+H	Load Combination		+D+Lr+H
Location of maximum on span	=	8.500 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	2.005 in	Ratio =	101 <180
Max Upward Transient Deflection	0.000 in	Ratio =	0 <180
Max Downward Total Deflection	2.807 in	Ratio =	72 <120
Max Upward Total Deflection	0.000 in	Ratio =	0 <120

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios									Moment Values			Shear Values		
Segment Length	Span #	M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	M	fb	F'b	V	fv	F'v
+D+H													0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.896	0.260	0.90	1.200	1.00	1.00	1.00	1.00	0.87	2.31	1,266.79	1414.58	0.51	42.06	162.00
+D+L+H					1.200	1.00	1.00	1.00	1.00	0.87			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.839	0.234	1.00	1.200	1.00	1.00	1.00	1.00	0.84	2.31	1,266.79	1509.48	0.51	42.06	180.00
+D+Lr+H					1.200	1.00	1.00	1.00	1.00	0.84			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	2.663	0.654	1.25	1.200	1.00	1.00	1.00	1.00	0.74	8.09	4,433.76	1664.81	1.78	147.22	225.00
+D+S+H					1.200	1.00	1.00	1.00	1.00	0.74			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.784	0.203	1.15	1.200	1.00	1.00	1.00	1.00	0.78	2.31	1,266.79	1615.00	0.51	42.06	207.00
+D+0.750Lr+0.750L+H					1.200	1.00	1.00	1.00	1.00	0.78			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	2.188	0.537	1.25	1.200	1.00	1.00	1.00	1.00	0.74	6.65	3,642.02	1664.81	1.46	120.93	225.00
+D+0.750L+0.750S+H					1.200	1.00	1.00	1.00	1.00	0.74			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.784	0.203	1.15	1.200	1.00	1.00	1.00	1.00	0.78	2.31	1,266.79	1615.00	0.51	42.06	207.00
+D+0.60W+H					1.200	1.00	1.00	1.00	1.00	0.78			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.719	0.146	1.60	1.200	1.00	1.00	1.00	1.00	0.61	2.31	1,266.79	1762.60	0.51	42.06	288.00

Wood Beam

DESCRIPTION: Typical Roof Beam (After Fire) - Assuming 1/2" from all sizes are burned off.

Load Combination		Max Stress Ratios									Moment Values			Shear Values		
Segment Length	Span #	M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	M	fb	F'b	V	fv	F'v
+D+0.750Lr+0.750L+0.450W+H					1.200	1.00	1.00	1.00	1.00	0.61			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	2.066	0.420	1.60	1.200	1.00	1.00	1.00	1.00	0.61	6.65	3,642.02	1762.60	1.46	120.93	288.00
+D+0.750L+0.750S+0.450W+H					1.200	1.00	1.00	1.00	1.00	0.61			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.719	0.146	1.60	1.200	1.00	1.00	1.00	1.00	0.61	2.31	1,266.79	1762.60	0.51	42.06	288.00
+0.60D+0.60W+0.60H					1.200	1.00	1.00	1.00	1.00	0.61			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.431	0.088	1.60	1.200	1.00	1.00	1.00	1.00	0.61	1.39	760.07	1762.60	0.30	25.24	288.00
+D+0.70E+0.60H					1.200	1.00	1.00	1.00	1.00	0.61			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.719	0.146	1.60	1.200	1.00	1.00	1.00	1.00	0.61	2.31	1,266.79	1762.60	0.51	42.06	288.00
+D+0.750L+0.750S+0.5250E+H					1.200	1.00	1.00	1.00	1.00	0.61			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.719	0.146	1.60	1.200	1.00	1.00	1.00	1.00	0.61	2.31	1,266.79	1762.60	0.51	42.06	288.00
+0.60D+0.70E+H					1.200	1.00	1.00	1.00	1.00	0.61			0.00	0.00	0.00	0.00
Length = 17.0 ft	1	0.431	0.088	1.60	1.200	1.00	1.00	1.00	1.00	0.61	1.39	760.07	1762.60	0.30	25.24	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr+H	1	2.8069	8.562		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.904	1.904
Overall MINimum	1.360	1.360
+D+H	0.544	0.544
+D+L+H	0.544	0.544
+D+Lr+H	1.904	1.904
+D+S+H	0.544	0.544
+D+0.750Lr+0.750L+H	1.564	1.564
+D+0.750L+0.750S+H	0.544	0.544
+D+0.60W+H	0.544	0.544
+D+0.750Lr+0.750L+0.450W+H	1.564	1.564
+D+0.750L+0.750S+0.450W+H	0.544	0.544
+0.60D+0.60W+0.60H	0.326	0.326
+D+0.70E+0.60H	0.544	0.544
+D+0.750L+0.750S+0.5250E+H	0.544	0.544
+0.60D+0.70E+H	0.326	0.326
D Only	0.544	0.544
Lr Only	1.360	1.360
H Only		

Wood Column

DESCRIPTION: Typical Column (Before Fire)

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Analysis Method : Allowable Stress Design
End Fixities Top & Bottom Pinned
Overall Column Height 11 ft
(Used for non-slender calculations)
Wood Species Douglas Fir-Larch
Wood Grade Select Structural

Fb +	1,500.0	psi	Fv	180.0	psi
Fb -	1,500.0	psi	Ft	1,000.0	psi
Fc - Prll	1,700.0	psi	Density	31.210	pcf
Fc - Perp	625.0	psi			

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1,900.0	1,900.0	1,900.0 ksi
Minimum	690.0	690.0	

Wood Section Name 4x4
Wood Grading/Manuf. Graded Lumber
Wood Member Type Sawn

Exact Width	3.50	in
Exact Depth	3.50	in
Area	12.250	in^2
Ix	12.505	in^4
Iy	12.505	in^4

Allow Stress Modification Factors

Cf or Cv for Bending	1.50
Cf or Cv for Compression	1.150
Cf or Cv for Tension	1.50
Cm : Wet Use Factor	1.0
Ct : Temperature Factor	1.0
Cfu : Flat Use Factor	1.0
Kf : Built-up columns	1.0 NDS 15.3.2
Use Cr : Repetitive ?	No

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 11 ft, K = 1.0
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 11 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 29.205 lbs * Dead Load Factor
AXIAL LOADS . . .
DL + LL: Axial Load at 11.0 ft, D = 0.5120, Lr = 1.280 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS	Max. Axial+Bending Stress Ratio =	0.3868 : 1
	Load Combination	+D+Lr+H
	Governing NDS Forumla	Comp Only, fc/Fc'
	Location of max.above base	0.0 ft
	At maximum location values are . . .	
	Applied Axial	1.821 k
	Applied Mx	0.0 k-ft
	Applied My	0.0 k-ft
	Fc : Allowable	384.407 psi
PASS	Maximum Shear Stress Ratio =	0.0 : 1
	Load Combination	+0.60D+0.70E+H
	Location of max.above base	11.0 ft
	Applied Design Shear	0.0 psi
	Allowable Shear	288.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .
Along Y-Y 0.0 in at 0.0 ft above base
for load combination : n/a
Along X-X 0.0 in at 0.0 ft above base
for load combination : n/a

Other Factors used to calculate allowable stresses . . .

Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
+D+H	0.900	0.215	0.1169	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+L+H	1.000	0.195	0.1161	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+Lr+H	1.250	0.157	0.3868	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+S+H	1.150	0.170	0.1153	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+0.750Lr+0.750L+H	1.250	0.157	0.3188	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+0.750L+0.750S+H	1.150	0.170	0.1153	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+0.60W+H	1.600	0.124	0.1139	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+0.750Lr+0.750L+0.450W+H	1.600	0.124	0.3160	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+0.750L+0.750S+0.450W+H	1.600	0.124	0.1139	PASS	0.0 ft	0.0	PASS	11.0 ft
+0.60D+0.60W+0.60H	1.600	0.124	0.06836	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+0.70E+0.60H	1.600	0.124	0.1139	PASS	0.0 ft	0.0	PASS	11.0 ft
+D+0.750L+0.750S+0.5250E+H	1.600	0.124	0.1139	PASS	0.0 ft	0.0	PASS	11.0 ft

DESCRIPTION: Typical Column (Before Fire)

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
+0.60D+0.70E+H	1.600	0.124	0.06836	PASS	0.0 ft	0.0	PASS	11.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction (k) @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments (k-ft) @ Base	@ Top	Mx - End Moments @ Base	@ Top
+D+H					0.541				
+D+L+H					0.541				
+D+Lr+H					1.821				
+D+S+H					0.541				
+D+0.750Lr+0.750L+H					1.501				
+D+0.750L+0.750S+H					0.541				
+D+0.60W+H					0.541				
+D+0.750Lr+0.750L+0.450W+H					1.501				
+D+0.750L+0.750S+0.450W+H					0.541				
+0.60D+0.60W+0.60H					0.325				
+D+0.70E+0.60H					0.541				
+D+0.750L+0.750S+0.5250E+H					0.541				
+0.60D+0.70E+H					0.325				
D Only					0.541				
Lr Only					1.280				
L Only									
S Only									
W Only									
E Only									
H Only									

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
+D+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+L+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+Lr+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+S+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+0.750Lr+0.750L+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+0.750L+0.750S+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+0.60W+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+0.750Lr+0.750L+0.450W+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+0.750L+0.750S+0.450W+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+0.60D+0.60W+0.60H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+0.70E+0.60H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+D+0.750L+0.750S+0.5250E+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
+0.60D+0.70E+H	0.0000 in	0.000 ft	0.0000 in	0.000 ft
D Only	0.0000 in	0.000 ft	0.0000 in	0.000 ft
Lr Only	0.0000 in	0.000 ft	0.0000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.0000 in	0.000 ft
S Only	0.0000 in	0.000 ft	0.0000 in	0.000 ft
W Only	0.0000 in	0.000 ft	0.0000 in	0.000 ft
E Only	0.0000 in	0.000 ft	0.0000 in	0.000 ft
H Only	0.0000 in	0.000 ft	0.0000 in	0.000 ft