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## Structural Analysis Report

**Structure:** Fence Post Foundation

**Proposed Carrier:** T-Mobile

**Site Number:** A5C0028A

**Site Name:** LEE'S SUMMIT FIRE STATION

**Site Address:** 207 S.E. DOUGLAS ST  
LEE'S SUMMIT, MO 64063

**Date:** September 3, 2025

**Result:** PASS

**Description:** Analysis of Proposed Fence Post Foundation  
Due to the Installation of New T-Mobile Loads

Prepared for:



Expires: 12-31-2026

I certify that these calculations were prepared  
by me or under my supervision and to  
the best of my knowledge and belief  
comply with the requirements of  
the local building code



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**G M SADAT, PE**  
Licensed Professional Engineer  
Expires: 12-31-2026

## SITE DETAILS

**Site Name/Code:** A5C0028A / LEE'S SUMMIT FIRE STATION  
**Engineer** WVR  
**Date** 9/3/2025



## FENCE POST FOUNDATION DESIGN

### CONTROLLING DESIGN CODE

2018 International Building Code

### DESIGN WIND PRESSURE

Basic Wind Speed (LRFD)  $V_{ult}$  : **109** mph  
Basic Wind Speed (ASD)  $V_{asd}$  : **84.4** mph

Exposure : **B**

Topographic Factor ( $K_{zt}$ ) : **1**  
Wind Directional Factor ( $K_d$ ) : **0.85**  
Gust Effect Factor ( $G_h$ ) : **0.85**  
Net Force Coefficient ( $C_f$ ) : **1.5**

( $K_z$ ) : **0.57**       $K_z = 2.01 (15/1200)^{(2/7.0)}$

$q_z$  : **8.91** psf       $q_z = 0.00256 K_z K_{zt} K_d V_{asd}^2$

### EFFECTIVE WIND PRESSURE

$p$  : **7.58** psf       $p = q_z G_h$

### DESIGN WIND LOAD

Fence Height ( $H$ ) : **7.83** ft  
Post Spacing ( $L_{post}$ ) : **6.00** ft  
Pier Diameter ( $b$ ) : **1.50** ft  
Pier Depth ( $d$ ) : **5.00** ft  
Distance to Force Center ( $h$ ) : **4.31** ft       $h = 0.55 H$

Allowable Lateral Soil Bearing Pressure (Slat): **100** psf (Class 5 Soil)  
Allowable Overstress Factor (Os): **2**  
Allowable Soil Bearing Pressure (S1): **333** psf  $S1 = Slat (d/3) Os$

Tributary Area (A): **47** sf  
Post Wind Load (P): **534** lb  $P = p Cf A$

**CHECK FOUNDATION POST**

(D): **2.50** ft  $D = 2.34 P / (S1 b)$

Required Depth (d): **4.90** ft  $d = 0.5 D (1 + \text{SQRT}(1 + 4.36(h/A)))$

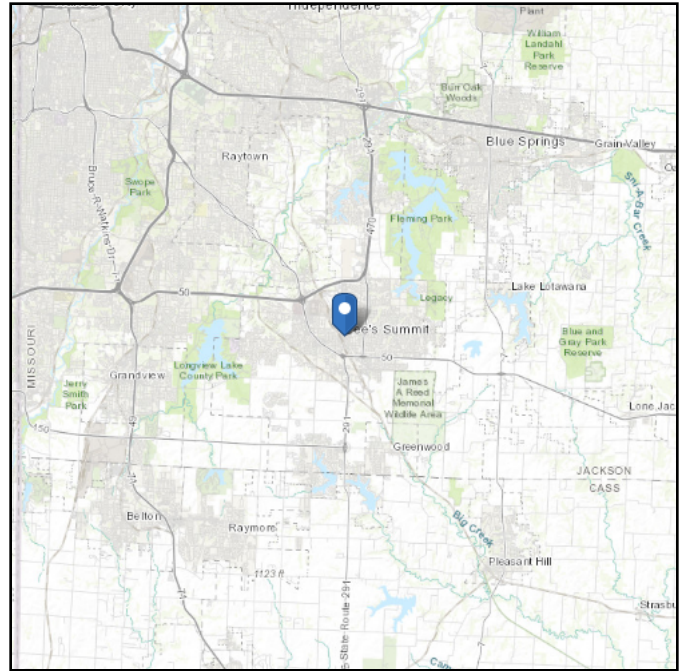
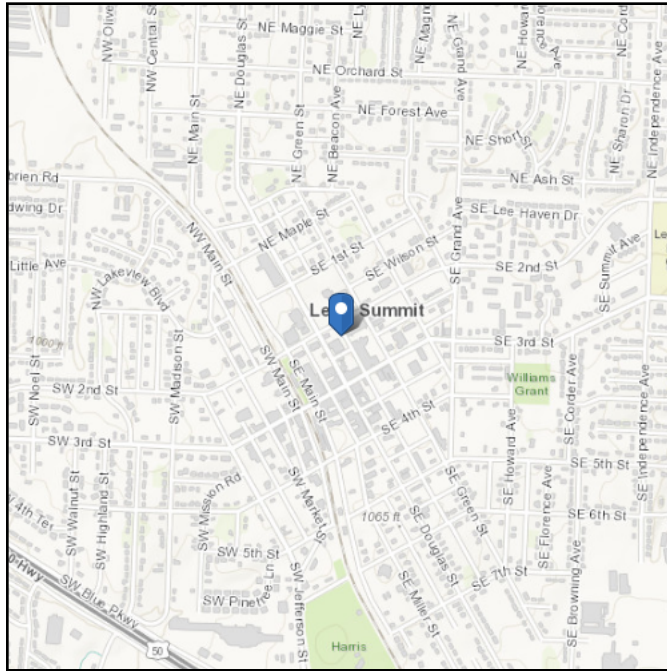
**Foundation is adequate, OK**

# ASCE Hazards Report

**Address:**  
No Address at This Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Stiff Soil

**Latitude:** 38.913922  
**Longitude:** -94.376416  
**Elevation:** 1023.3253145639942 ft (NAVD 88)



## Wind

### Results:

Wind Speed	109 Vmph
10-year MRI	76 Vmph
25-year MRI	83 Vmph
50-year MRI	88 Vmph
100-year MRI	94 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2  
Date Accessed: Wed Sep 03 2025

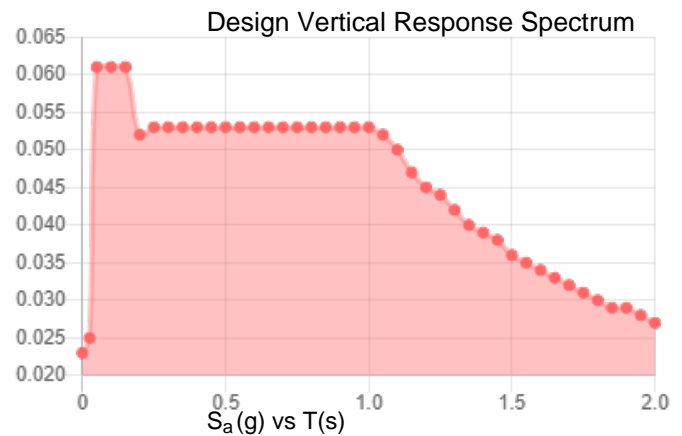
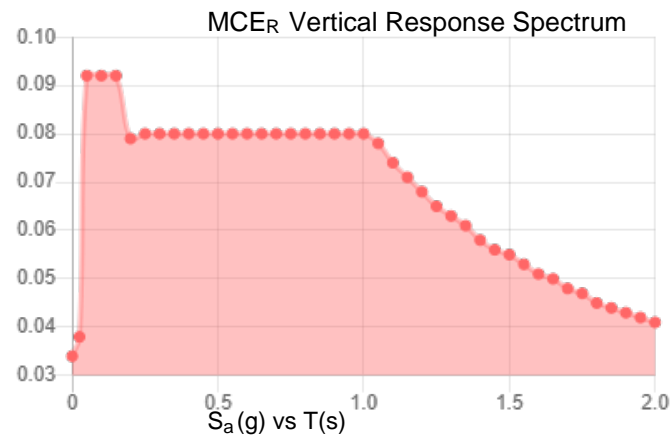
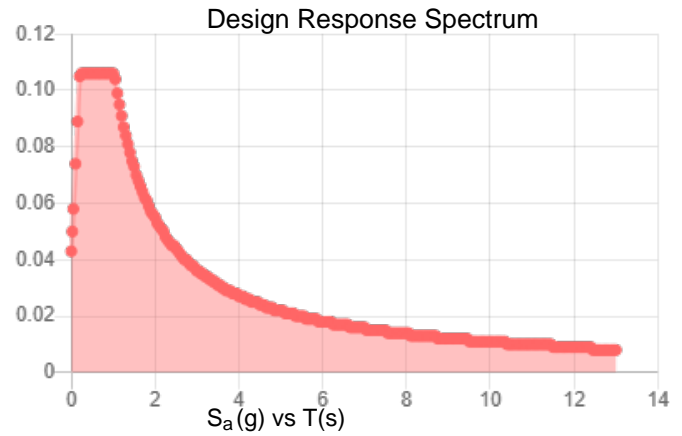
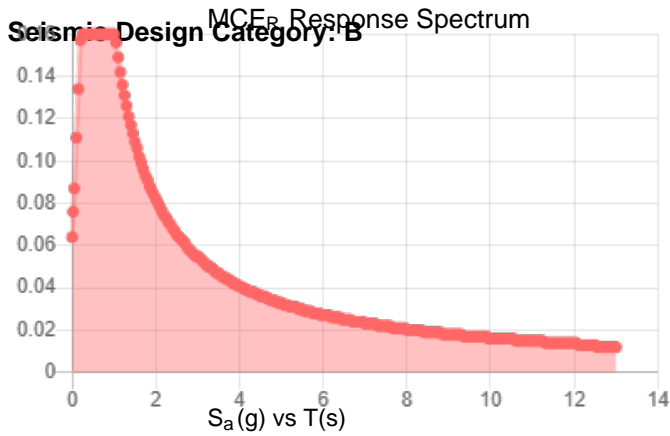
Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.1	$S_{D1}$ :	0.109
$S_1$ :	0.068	$T_L$ :	12
$F_a$ :	1.6	PGA :	0.047
$F_v$ :	2.4	PGA <sub>M</sub> :	0.076
$S_{MS}$ :	0.16	$F_{PGA}$ :	1.6
$S_{M1}$ :	0.164	$I_e$ :	1
$S_{DS}$ :	0.106	$C_v$ :	0.7



**Data Accessed:** Wed Sep 03 2025

**Date Source:**

**USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.**

## Ice

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**Results:**

Ice Thickness: 1.50 in.  
Concurrent Temperature: 5 F  
Gust Speed 40 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Wed Sep 03 2025

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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