

CKR ENGINEERS

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STRUCTURAL CALCULATIONS

Mo'Bettahs - Lee's Summit
NW Chipman Rd & NW Ward Rd
Lee's Summit, MO

Project: 23150

April 10, 2023



Daniel D
Goodrich

Digitally signed by Daniel D
Goodrich
DN: cn=Daniel D Goodrich, c=US,
o=Utah,
email=dang@ckrengineers.com
Date: 2023.04.10 15:04:24 -06'00'

Scope of Work

- Gravity analysis
- Lateral analysis
- Structural design to resist gravity and lateral forces
- Calculations are valid only at the above address
- Sign drawings attached for reference only
- Design of sign cabinets not included

Design Summary

Project: Mo'Bettahs - Lee's Summit
Job #: 23150
Date: 4/10/2023

Sign Pole

A standard **6** in Schedule 40 pipe is adequate for strength and deflection.

Sign Foundation

A **3** ft diameter x **5** ft deep unreinforced concrete footing under the sign is adequate.

Design Criteria:

2018 International Building Code

Project: Mo'Bettahs - Lee's Summit
Address: NW Chipman Rd & NW Ward Rd
City, State: Lee's Summit, MO
Job #: 23150
Date: 4/10/2023

Design Loads per ASCE/SEI 7-16

*Minimum Design Loads for Buildings
and Other Structures*

General	(Chapter 1)	Risk Category = II Table 1.5-1	
Dead Load	(Chapter 3)	ASD Level	
	Sign Weight	5 psf	
Wind Load	(Chapters 26-31)	Strength Level	
		V = 109 mph	Figure 26.5-1, or value from https://hazards.atcouncil.org
		V _{asd} = 84 mph	IBC Section 1609.3.1
		Exposure: B	Section 26.7

Project: Mo'Bettahs - Lee's Summit
Location: Lee's Summit, MO
Job #: 23150

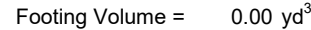
Soil Passive Pres. = 150 pcf Perpendic

Pole F_y = 35 ksi

Pole E = 29000 ksi

Pole = PIPE6STD

Only round sections are currently supported

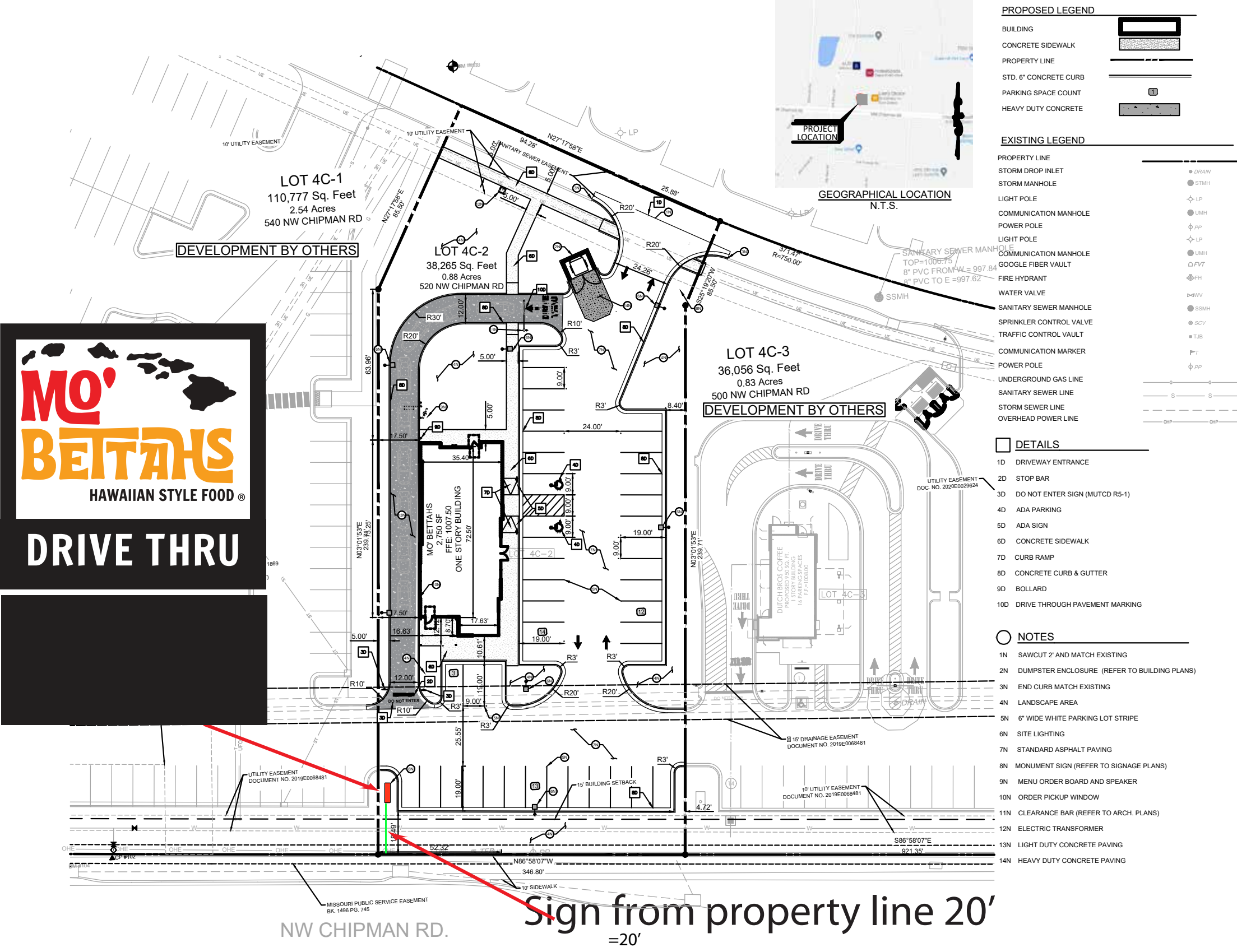


Pole Analysis (ASD)					
Assume Pole extends up to bottom of Cab 1					
Cabinet	Cab WT (psf)	Cab WT (lbf)	Pole Section Properties		Column Capacity
			A =	5.58 in ²	KL/r = 134.40 ***
1	10.0	640	I =	28.1 in ⁴	F _e = 15.85 ksi
2	10.0	320	S =	8.5 in ³	Q = 1
3		0	Z =	11.3 in ³	F _{cr} = 13.89 ksi
4		0	r =	2.25 in	Ω _b = Ω _c = 1.67
		960	D/t =	23.7	Ω _c *Pn = 46.40 kips
			K =	2.1	Ω _b *Mn = 19.74 k*ft
			L =	12 ft	Unity = 0.370
			E/F _y =	828.57	Deflection at Top = 0.51 in
					0.025 * L = 3.6 in
*** KL/r > 200 is permitted, but not recommended.					

Monument Sign Mobettahs

Steel + Aluminum Construction
Multi-Layered Vinly on Acrylic Face
Aluminum pole cover
Center Pole is 6" Diameter
12V LED Lighted

RELEASED FOR
CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
05/25/2023



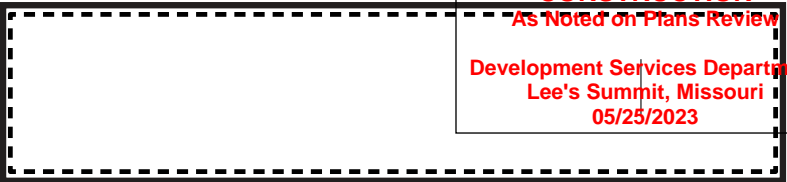
NORTHWEST CHIPMAN ROAD & NORTHWEST WARD ROAD, MO

Monument Sign Mobettahs

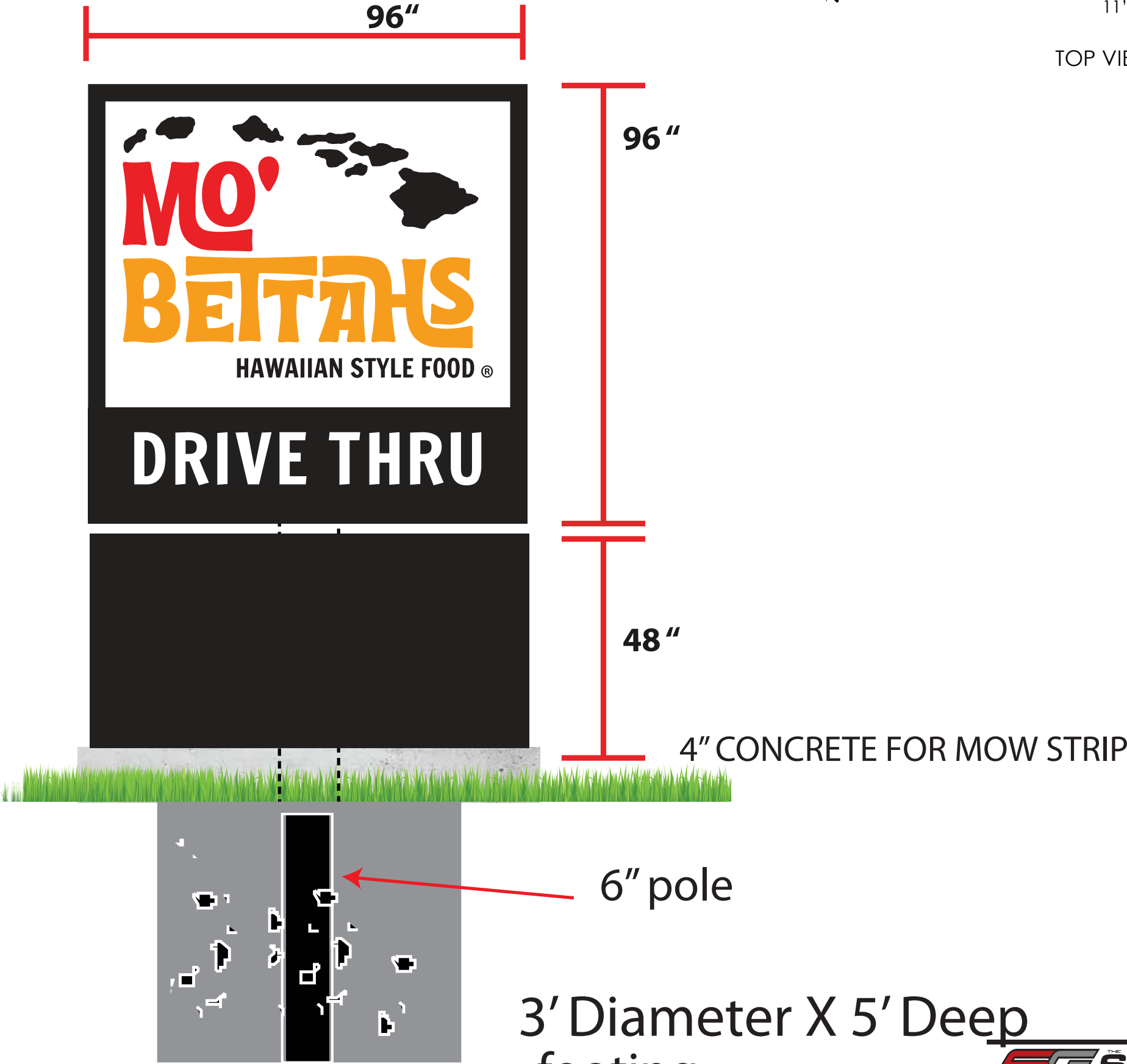
Steel + Aluminum Construction
Multi-Layered Vinly on Acrylic Face
Aluminum pole cover
Center Pole is 6" Diameter Schedule 40
12V LED Lighted

MONUMENT - DOUBLE SIDED

24"



TOP VIEW



NORTHWEST CHIPMAN ROAD & NORTHWEST WARD ROAD, MO

3' Diameter X 5' Deep
footing