



THE UNIVERSITY OF TEXAS AT ARLINGTON

The Impacts of NESC 250C Extreme Wind Loading on Structures Less Than 60 Feet

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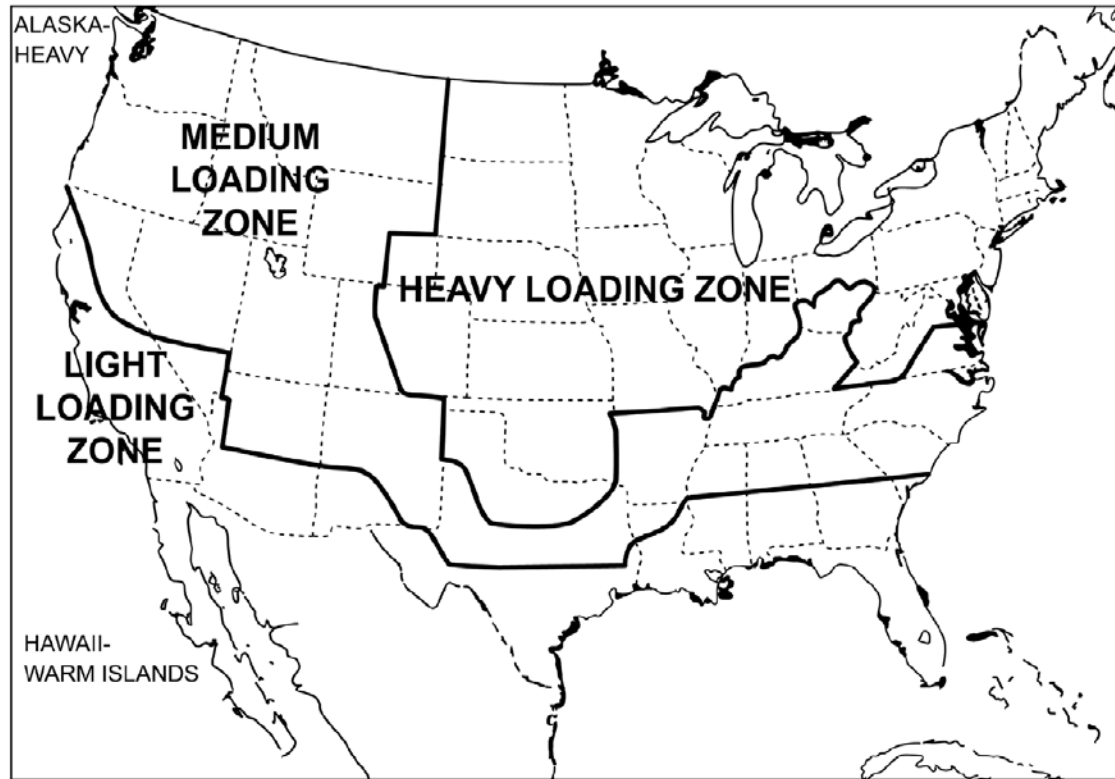


ABSTRACT

- Three loadings
- Only one required if less than 60 feet
- Design only for required



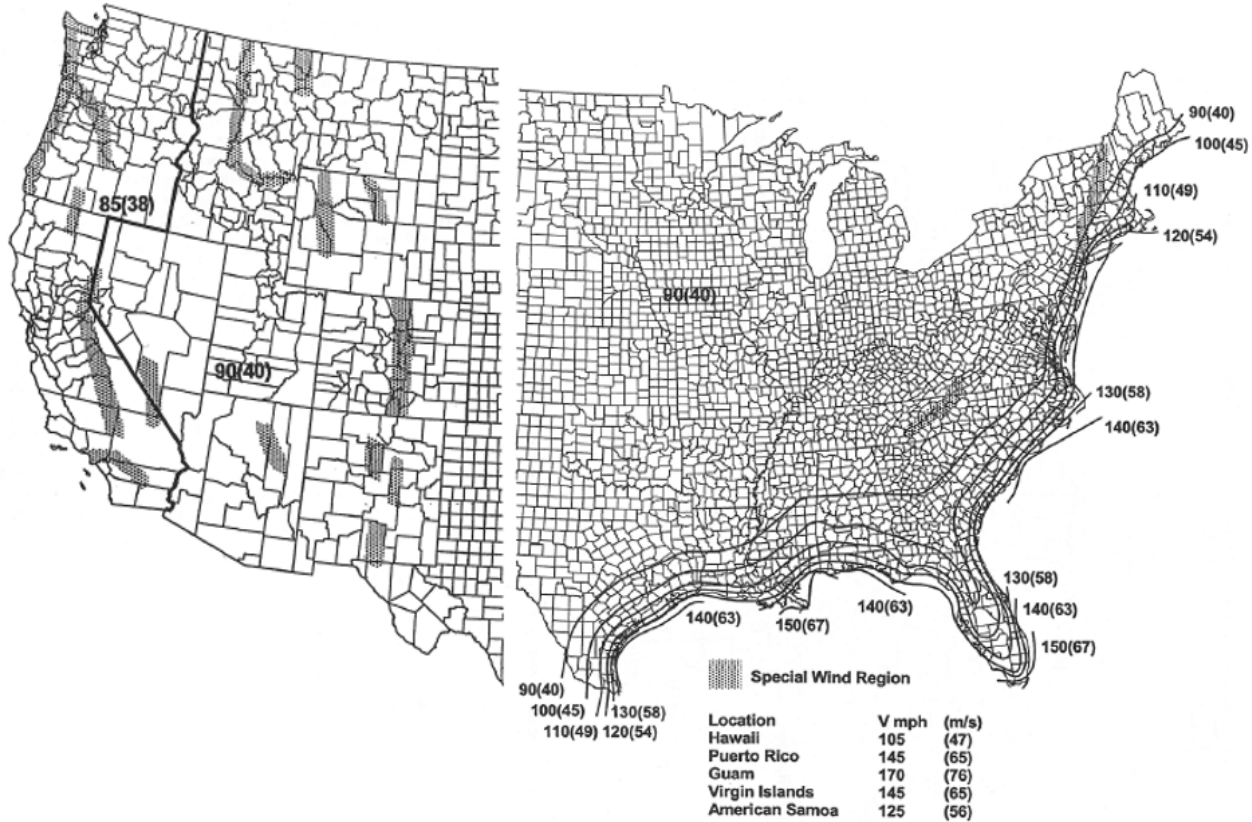
250B COMBINED ICE AND WIND



LOADING DISTRICT	HEAVY	MEDIUM	LIGHT
Radial Ice Thickness (IN)	0.50	0.25	0
Horizontal Wind Pressure (PSF)	4	4	9
Temperature (°F)	0	15	30
Additive Constant (LB/FT)	0.30	0.20	0.05



250C EXTREME WIND LOADING

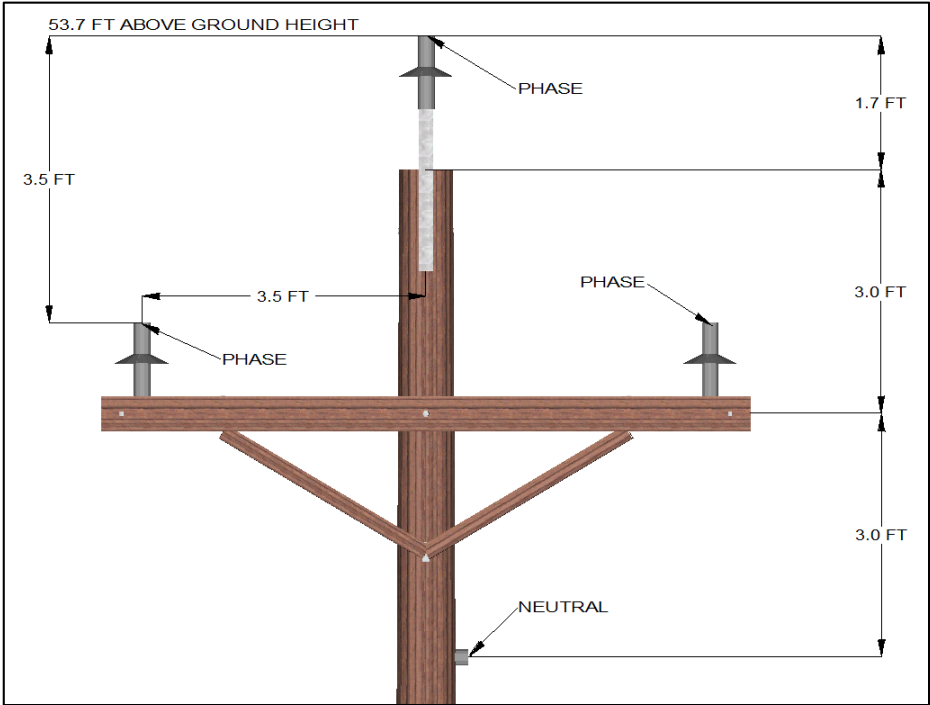


ANALYSIS

- Distribution

	WIRE
Phase	336.4 kcmil Tulip AAC
Neutral	4/0 AWG Oxlip AAC

TP-1 FRAMING

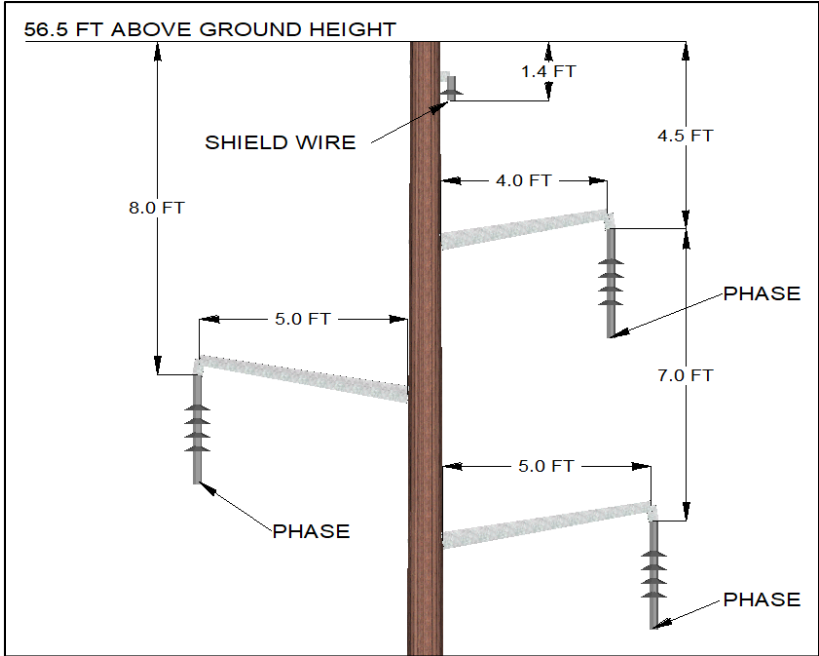


ANALYSIS

- Transmission

	WIRE
Shield	3/8 inch EHS Steel
Phase	795 kcmil Drake ACSR

TU-1 FRAMING



WOOD POLES

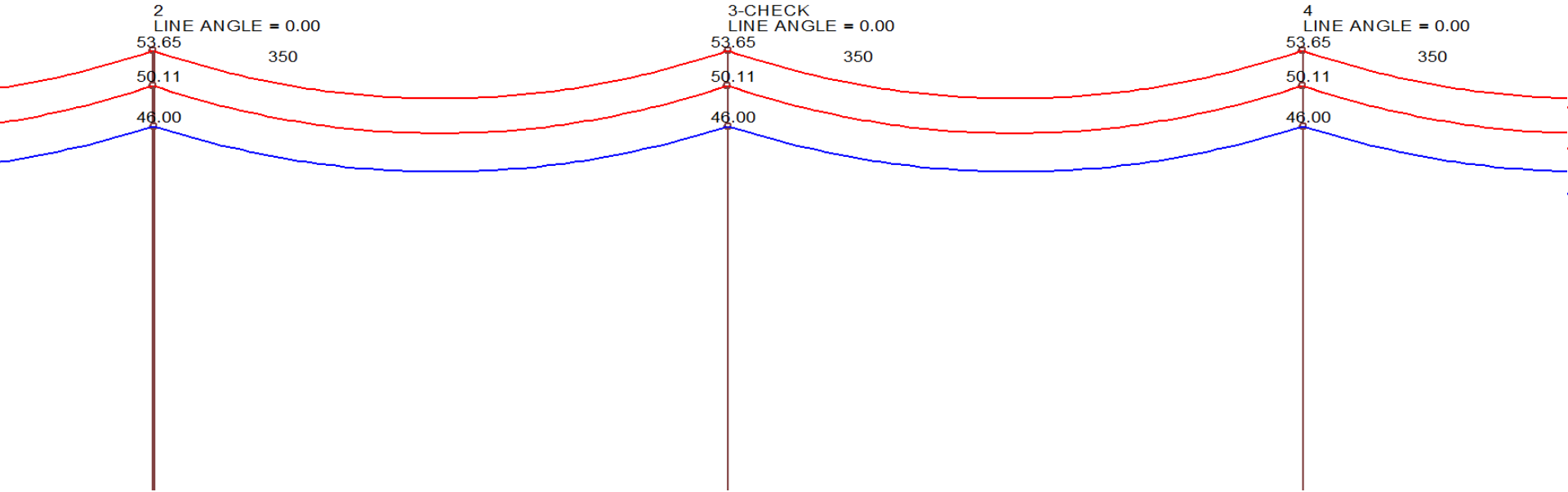
Wood Material Properties

ANSI O5.1.2017 - American National Standard for Wood Poles and Wood Products
Wood Poles - Specifications and Dimensions

Material Label	SP-Southern Pine
Modulus of Elasticity (ksi)	2130
Design Stress MOR (ksi)	8
Weight Density (lbs/ft³)	60
ANSI O5.1 Status	Included



PLS-CADD MODELING



LOAD FACTORS AND STRENGTH FACTORS

Load Factors

RULE	LOAD COMPONENT	GRADE B LOAD FACTOR	GRADE C (ELSEWHERE) LOAD FACTOR
250B	Vertical	1.50	1.90
250B	Transverse Wind	2.50	1.75
250B	Transverse Wire	1.65	1.30
250B	Longitudinal in General*	1.10	No requirement
250B	Longitudinal at Deadends*	1.65	1.30
250C	Wind Loads	1.00	0.87**
250C	All other Loads	1.00	1.00

Wood Strength Factors

RULE	GRADE B	GRADE C
250B	0.65	0.85
250C	0.75	0.75

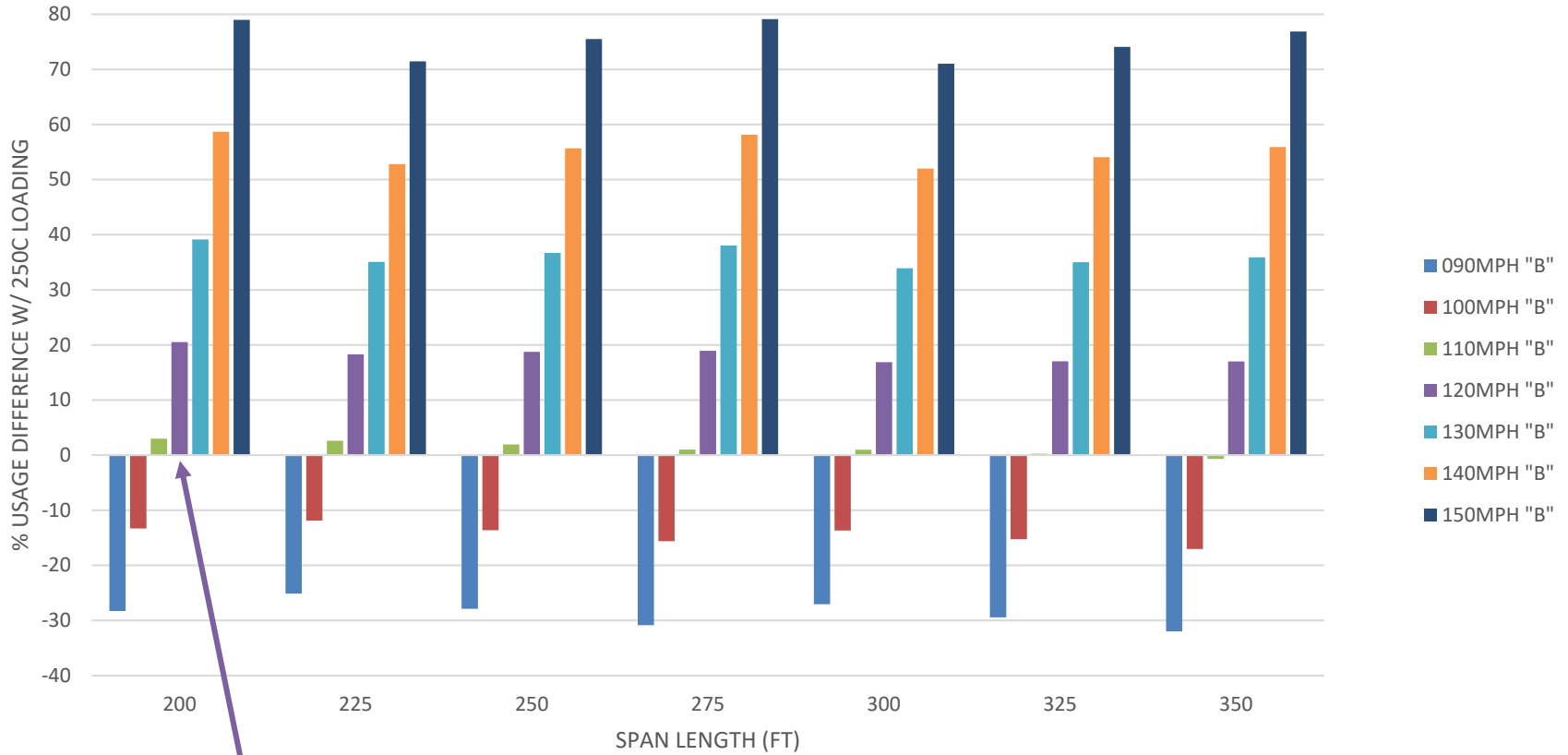


RESULTS

- Three loading zones
- Transmission and distribution
- Grades B and C construction



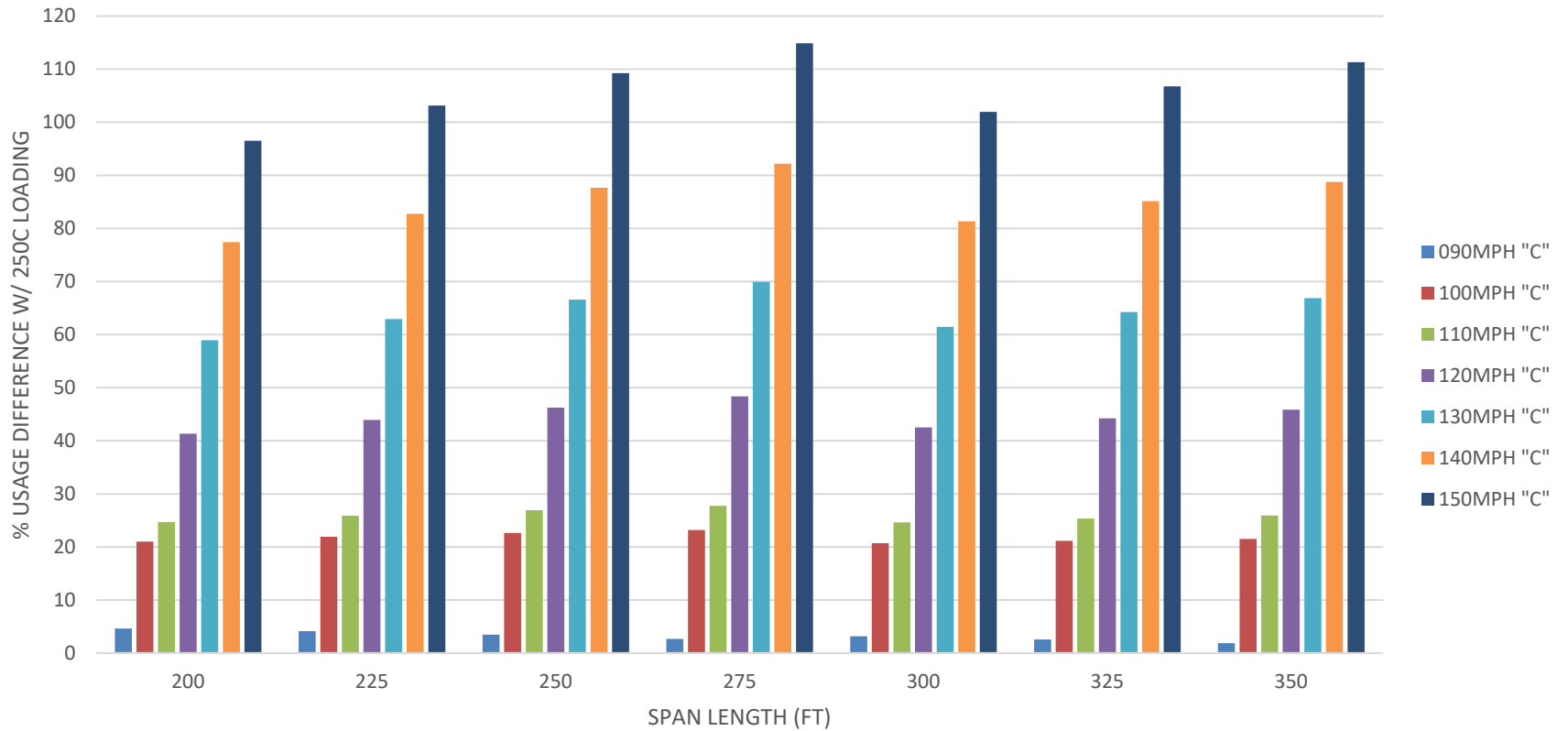
LIGHT LOADING, GRADE B, DISTRIBUTION



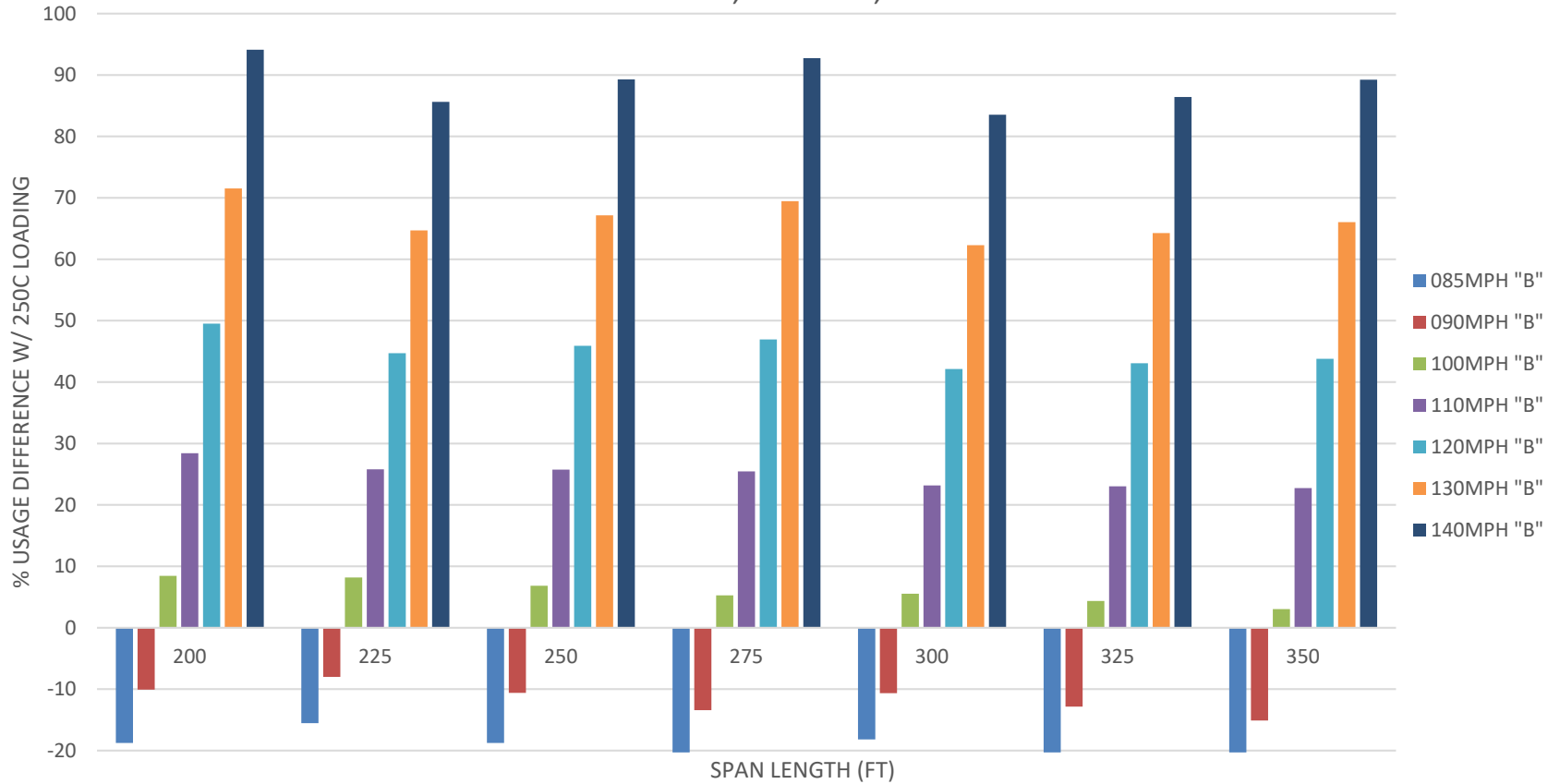
$(250C \text{ usage at } 120 \text{ MPH}) 114.38\% - (250B \text{ usage}) 93.86\% = 20.52$



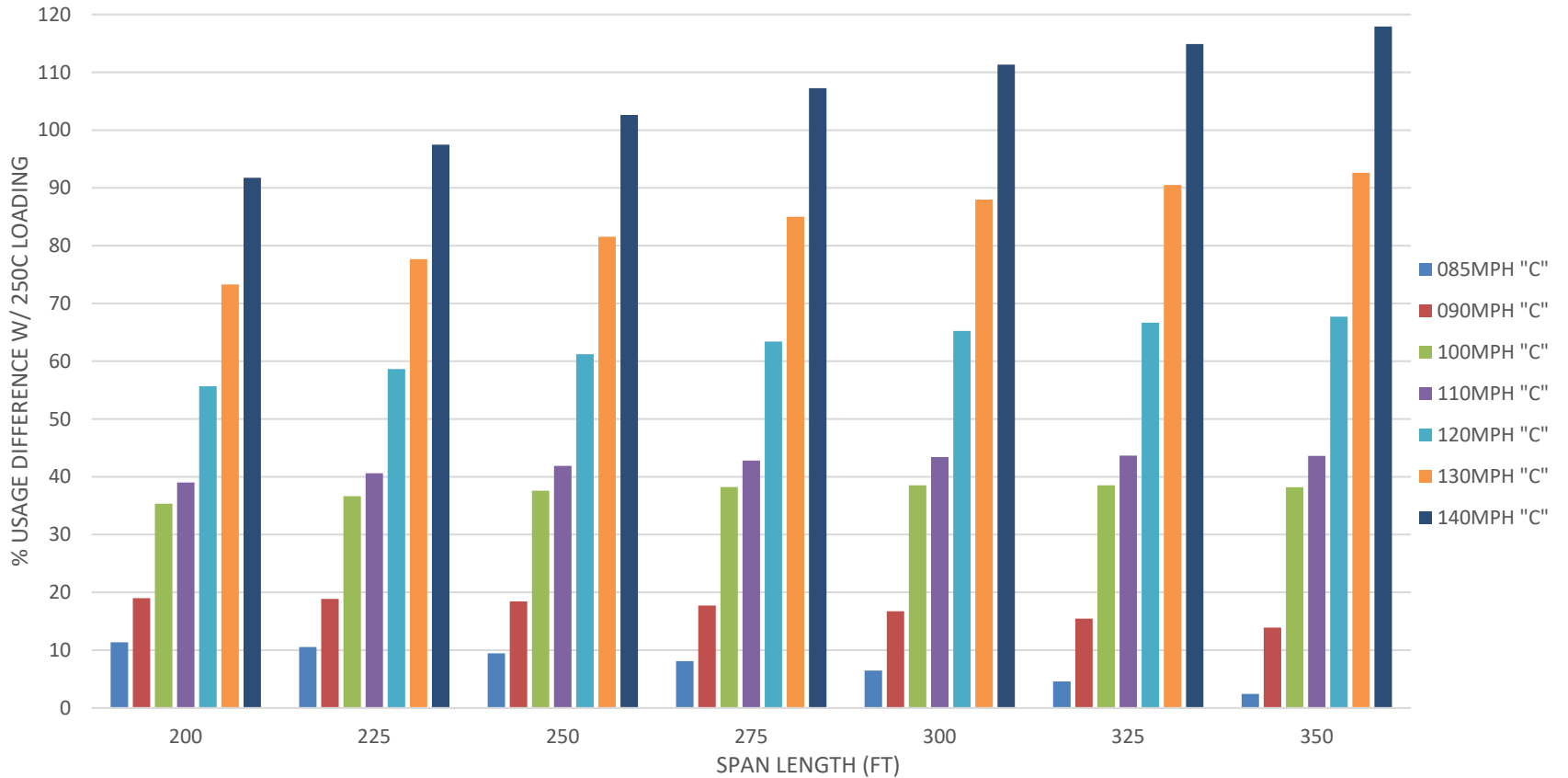
LIGHT LOADING, GRADE C, DISTRIBUTION



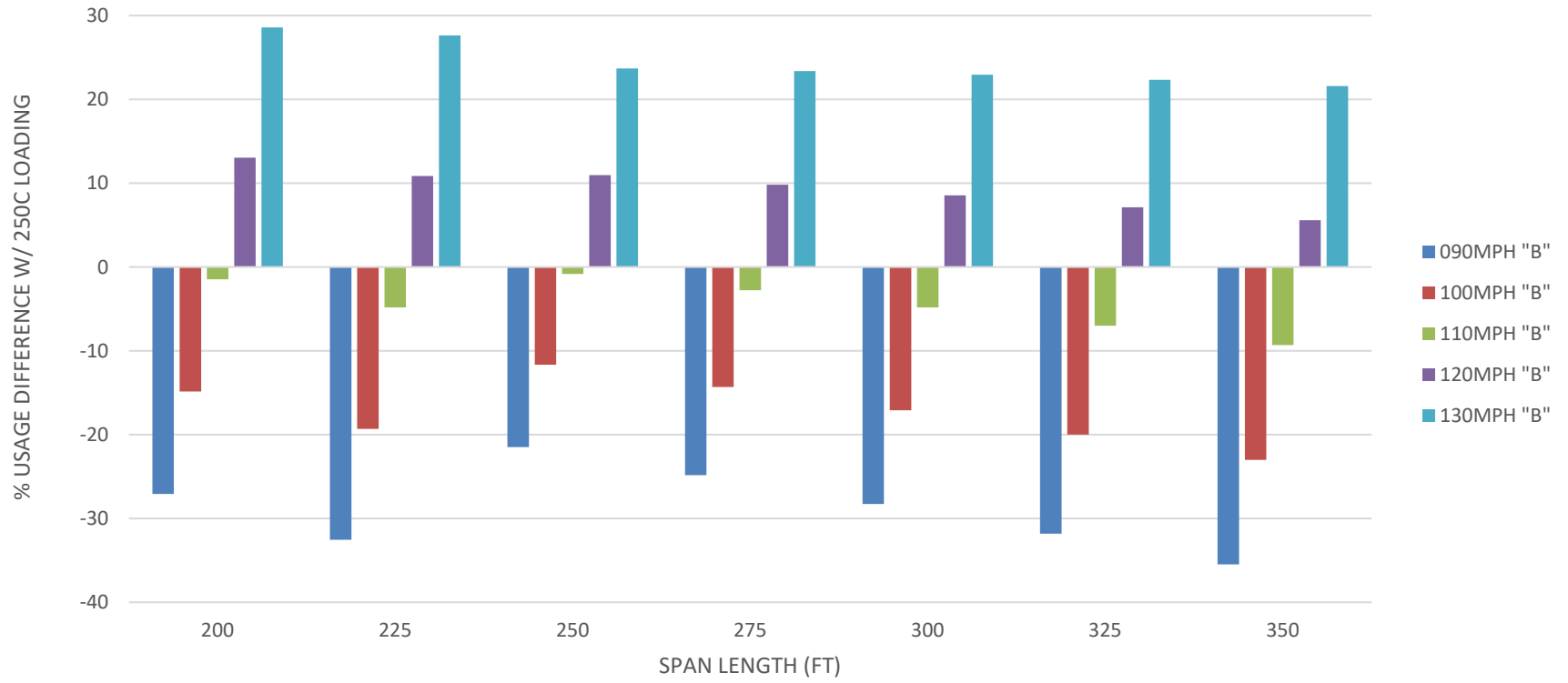
MEDIUM LOADING, GRADE B, DISTRIBUTION



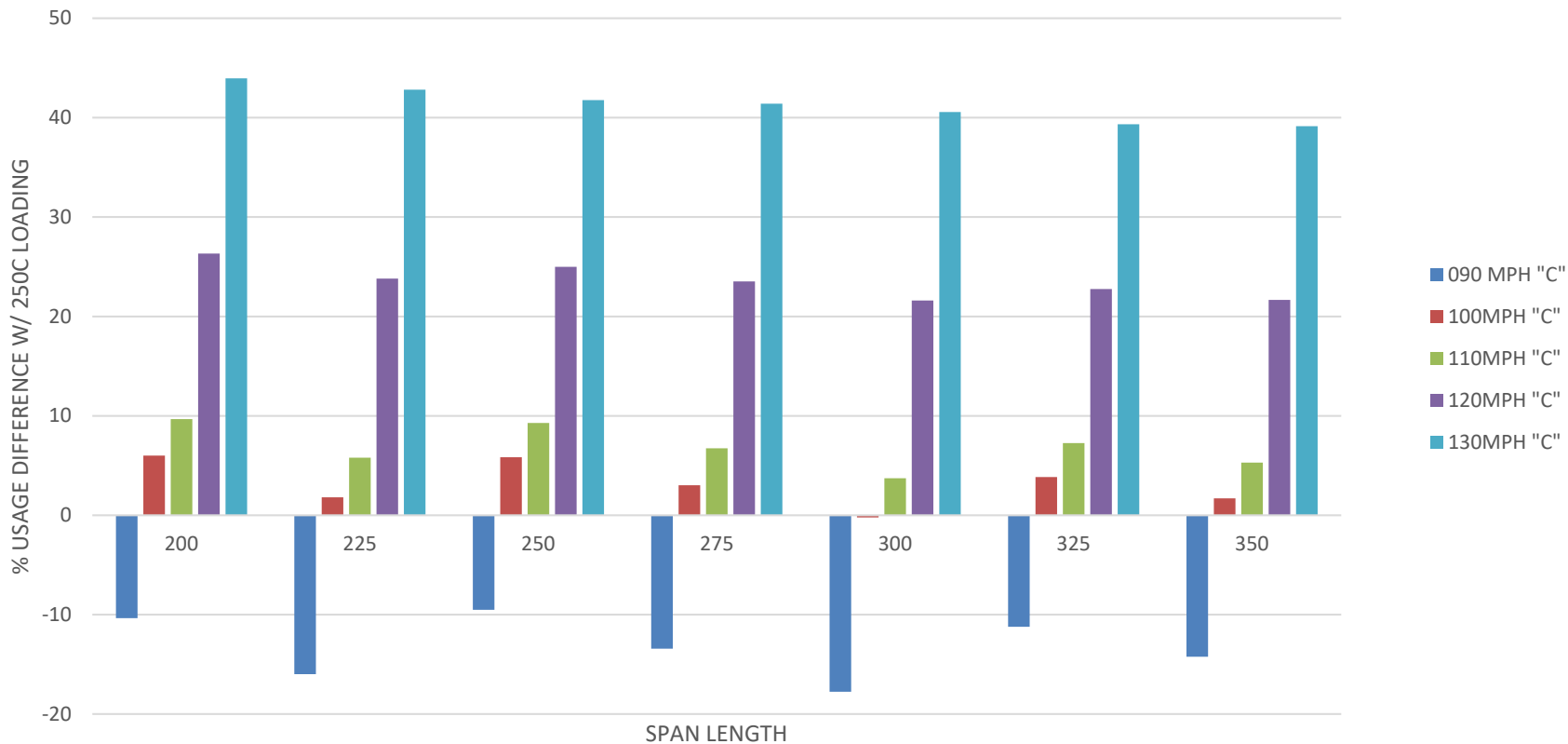
MEDIUM LOADING, GRADE C, DISTRIBUTION



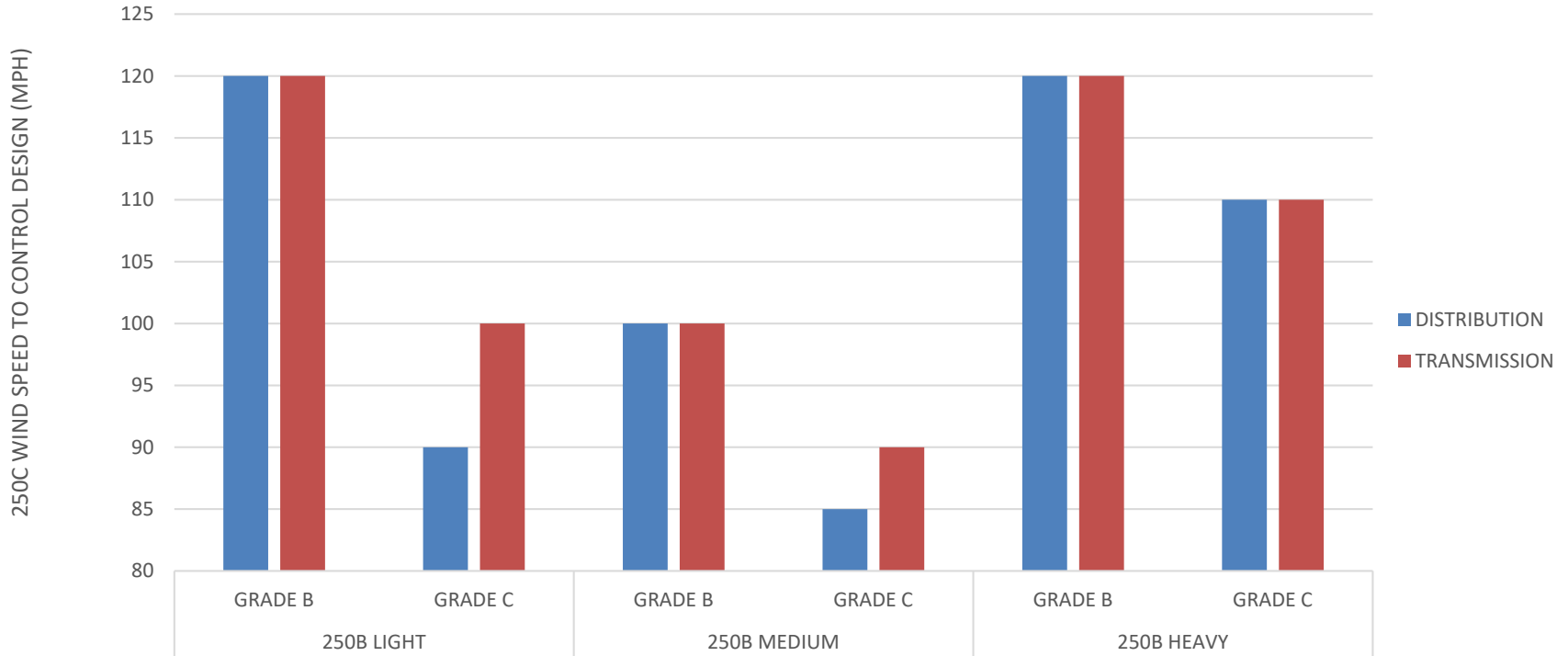
HEAVY LOADING, GRADE B, DISTRIBUTION



HEAVY LOADING, GRADE C, DISTRIBUTION



SUMMARY



GRADE B, DISTRIBUTION



GRADE C, DISTRIBUTION

