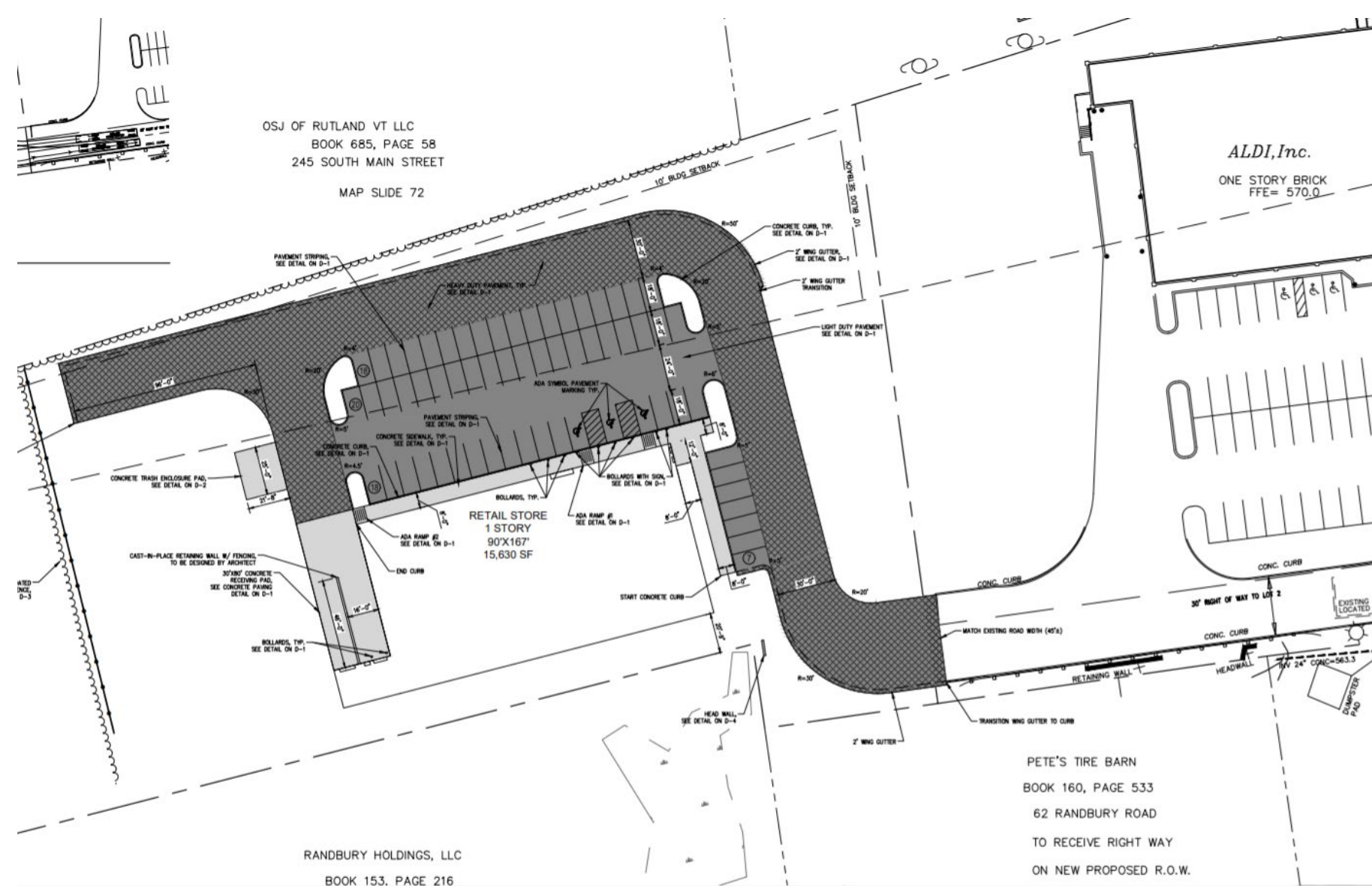


BACKGROUND

The Harbor Freight Tools Building is located at 263 South Main Street in Rutland, Vermont. The site is roughly 3.5 acres including all driveways and parking lots. The primary structure is 15,630 sq.ft. and single story.

SITE LAYOUT



Provided by: Tamarack Grove Engineering

DESIGN PARAMETERS

Vertical and loading was determined in accordance with the ASCE 7-10. All design calculations were utilized Load Resistance Factor Design Method (LRFD). Hand calculations of individual components were performed using these values, then analyzed on RisaFloor and Risa3D.

Roof

- Live Load: 20 PSF
- Dead Load: 2 PSF
- Snow Load: 55 PSF

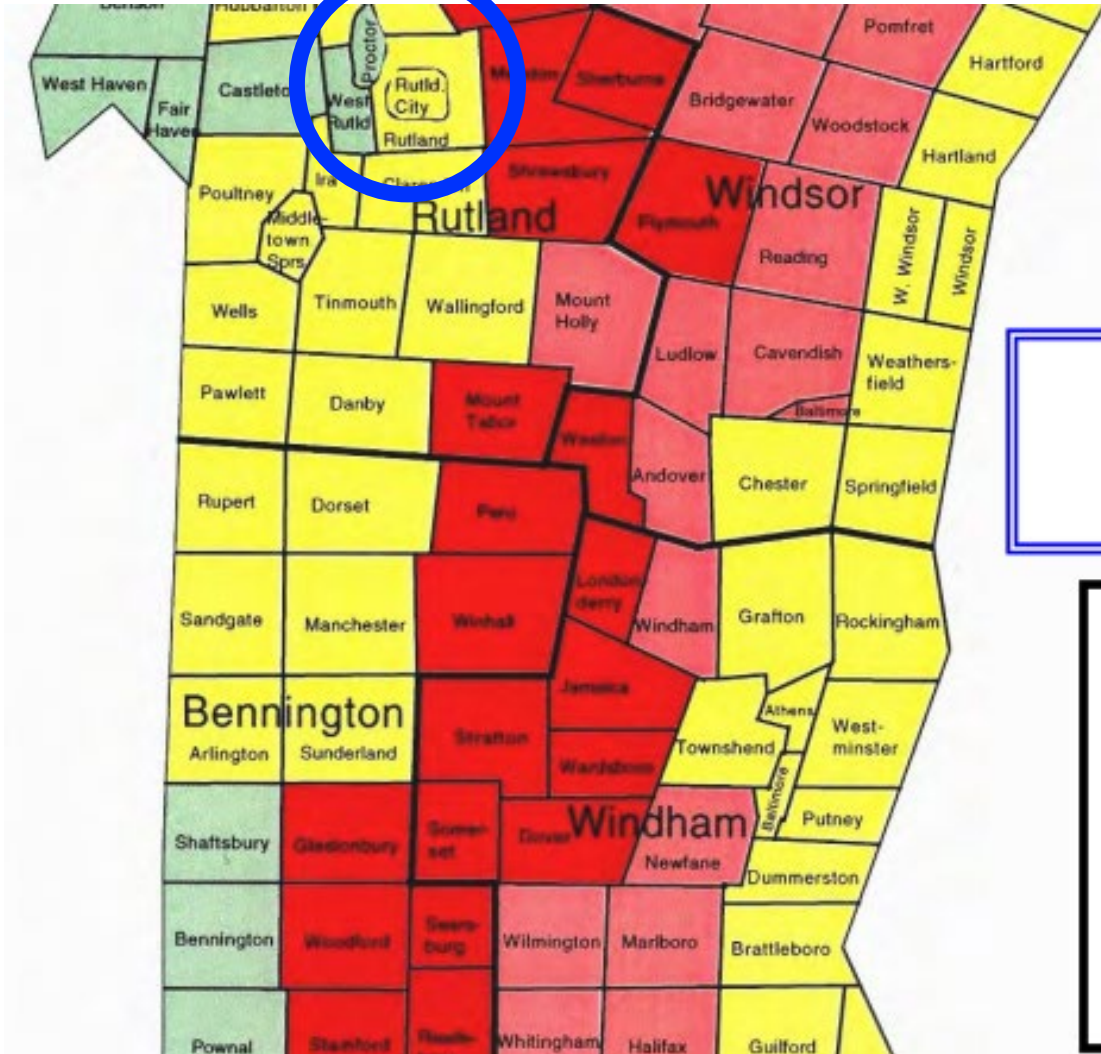
Floor

- Live Load: 100 PSF
- Dead Load: 25 PSF

Lateral

- Top Wind Load: 24.7 PSF
- Bottom Wind Load 24.4 PSF

SITE-SPECIFIC HIGH SNOW LOAD



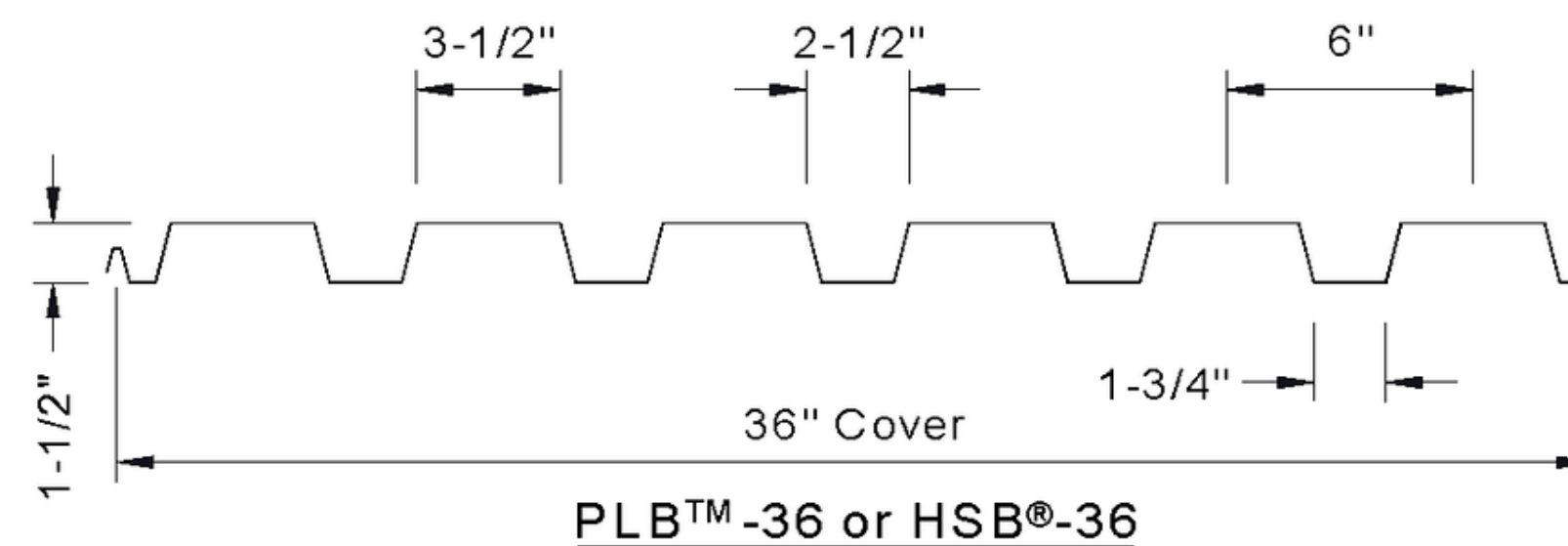
MINIMUM GROUND SNOW LOADS
In pounds per square foot

Key

- 40 lbs.
- 50 lbs.
- 60 lbs
- 70 lbs

ROOF DECKING

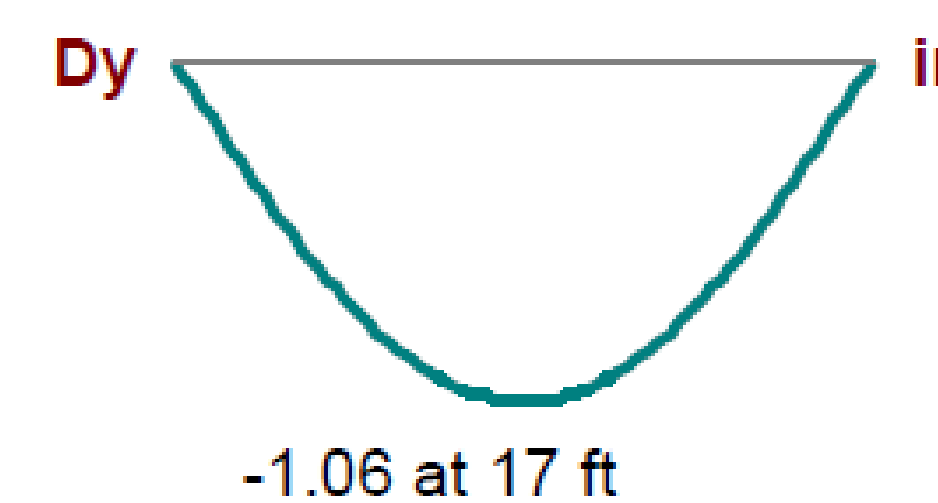
The roof decking used in the construction of this building is Verco Type HSB®-36, 22 GA X 1 1/2".



STEEL FRAMING

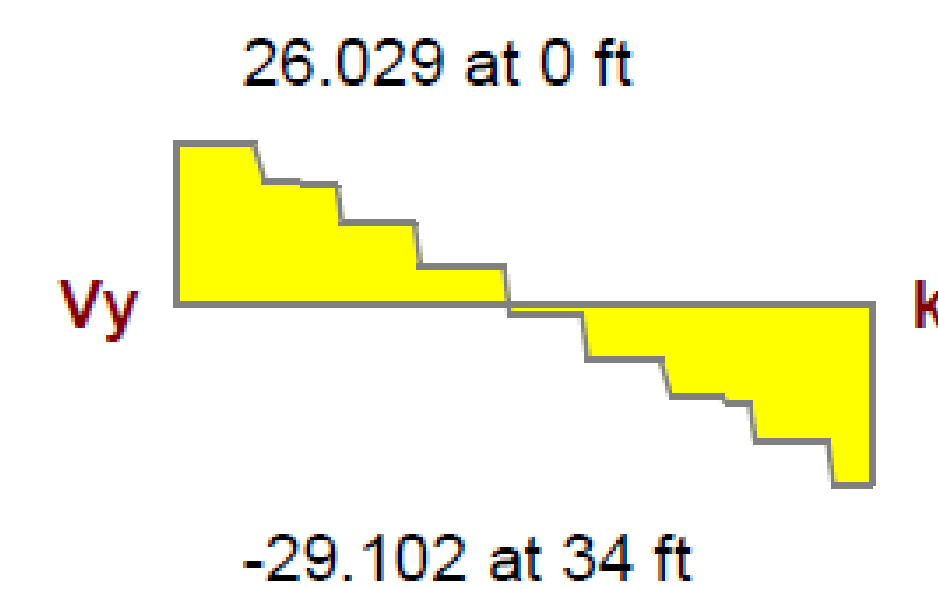
Primary Horizontal Girder

- Designation: W24x76
- Material: A992
- Maximum Span: 34 ft



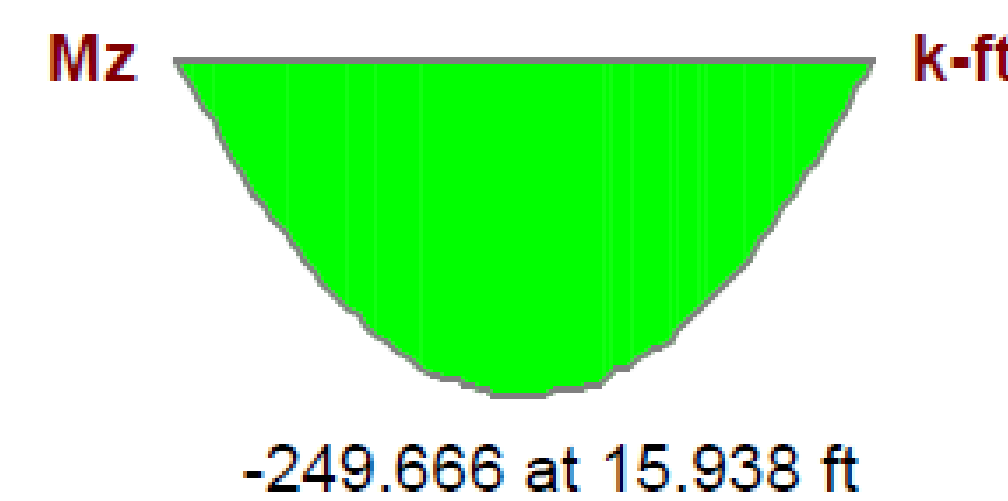
LH-Series Joist

- Designation: LH24X10
- Maximum Span: 48 ft



K-Series Joist

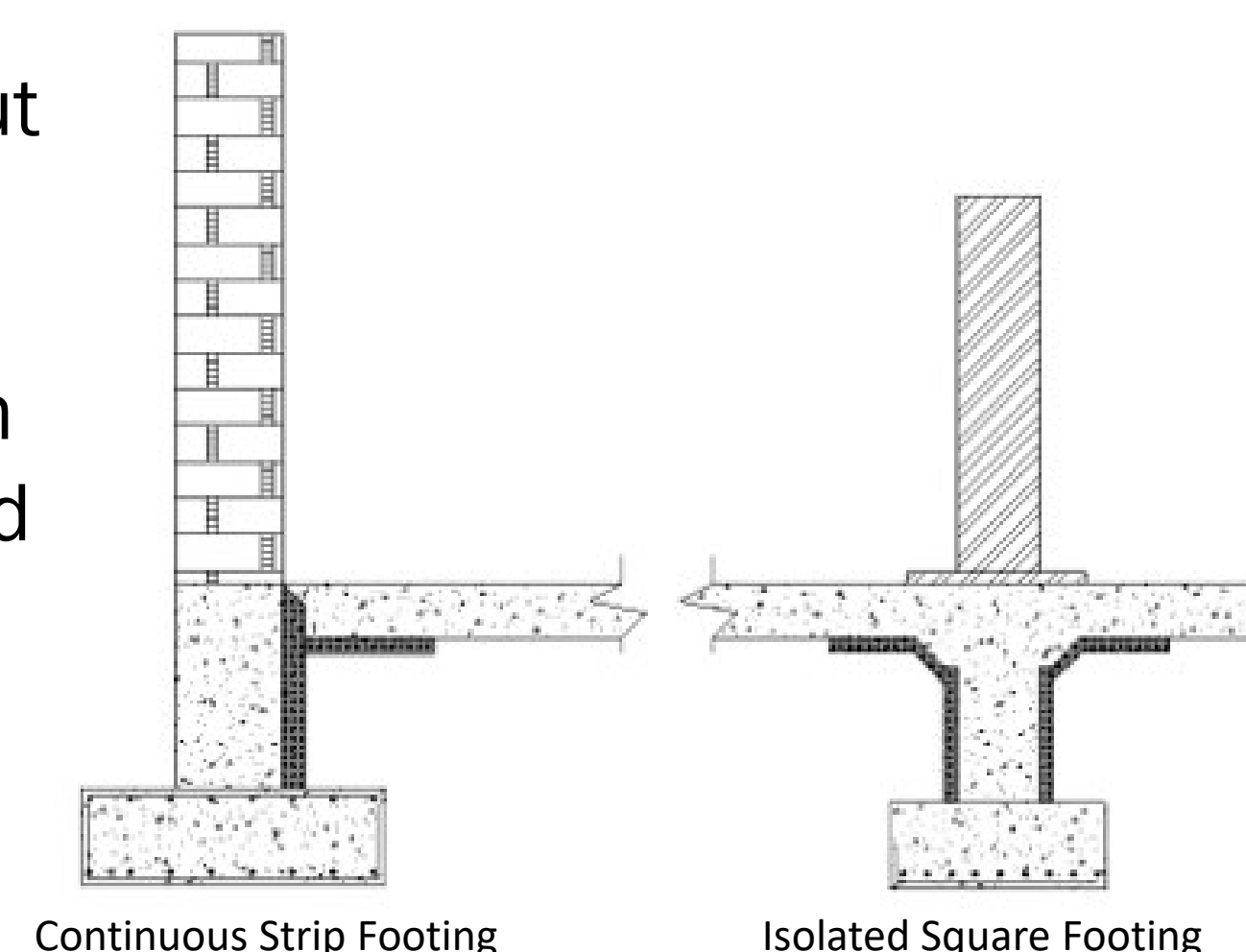
- Designation: 14KX4
- Maximum Span: 20 ft



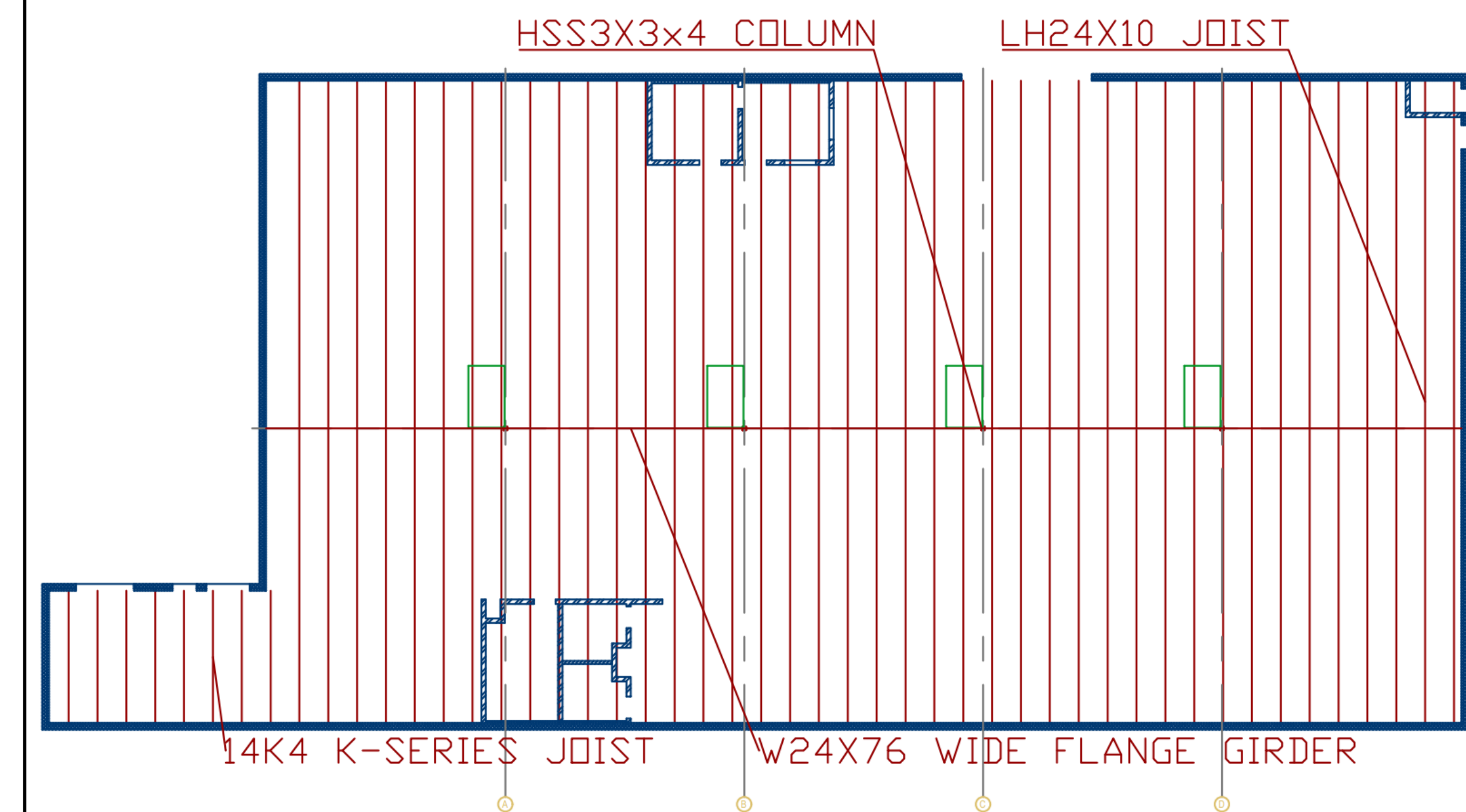
CONCRETE FOUNDATION & FOOTINGS

Sized to meet the structural standards set out in ACI 318-14.

- Continuous Footing reinforced w/ #8 bottom bars hooked at ends and #5 bars.
- Square Footing: Reinforced w/ #6 bars in both directions.



STEEL LAYOUT

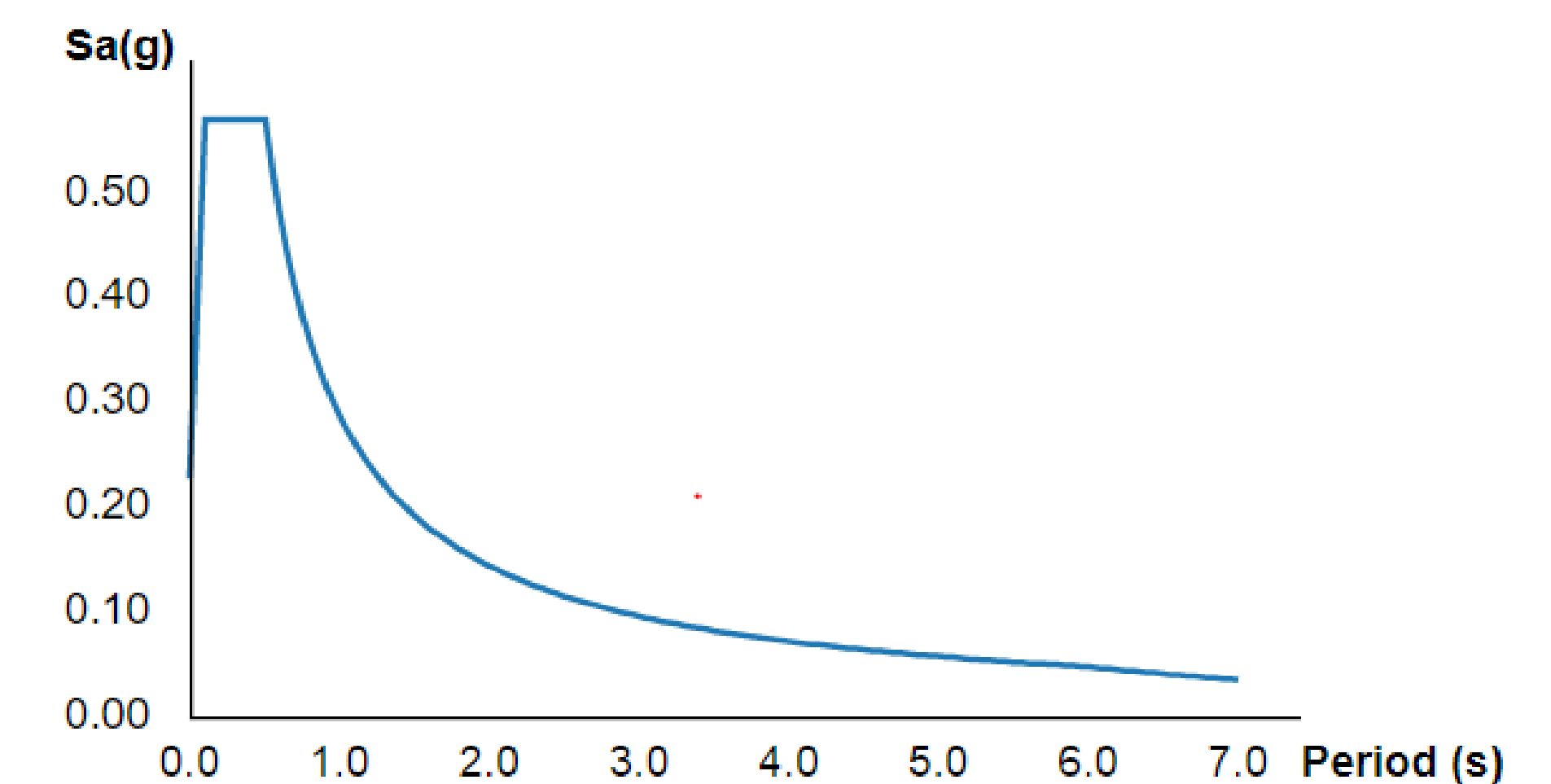


SEISMIC ANALYSIS

Basic Parameters

Name	Value	Description
S _S	0.228	MCE _R ground motion (period=0.2s)
S ₁	0.082	MCE _R ground motion (period=1.0s)
S _{MS}	0.571	Site-modified spectral acceleration value
S _{M1}	0.288	Site-modified spectral acceleration value
S _{DS}	0.381	Numeric seismic design value at 0.2s SA
S _{D1}	0.192	Numeric seismic design value at 1.0s SA

MCER Horizontal Response Spectrum



Course Advisor: Dr. Fritz Fielder, P.E.

Special thanks to Dr. Ahmed Ibrahim, P.E., in regards of providing important insight and being a reliable resource.