

# Load Rating



# Why is Load Rating Important?

## ► Definition

- The determination of the live-load carrying capacity of an existing bridge.

-AASHTO *Manual for Bridge Evaluation (MBE)*  
Third Edition



ion

Be Legendary.™



# Load Rating Equation

$$RF = \frac{\phi \phi_C \phi_S \phi_n \phi_{DC} (DC) (DW)}{LIVE (LL) (AD + IM)}$$

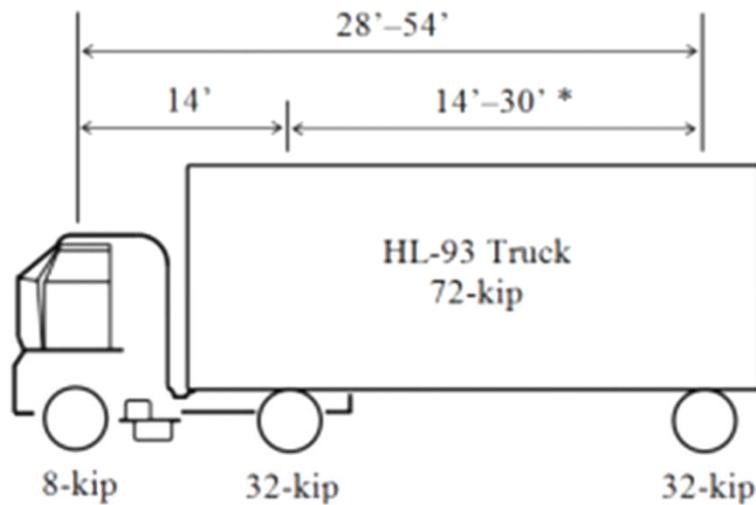
Capacity

Dead Load

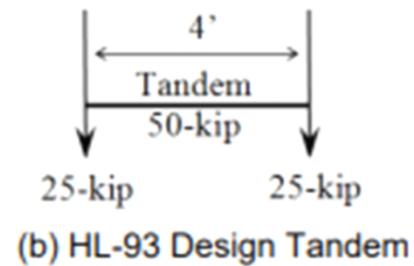
Live Load

# Live Load (Design Level)

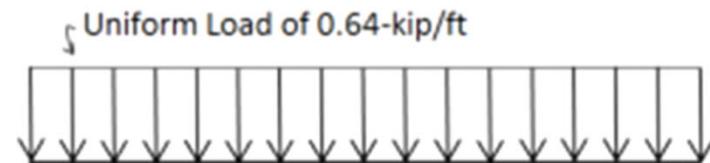
## HL-93 Design Load



(a) HL-93 Design Truck  
(\* Varies for maximum effect)



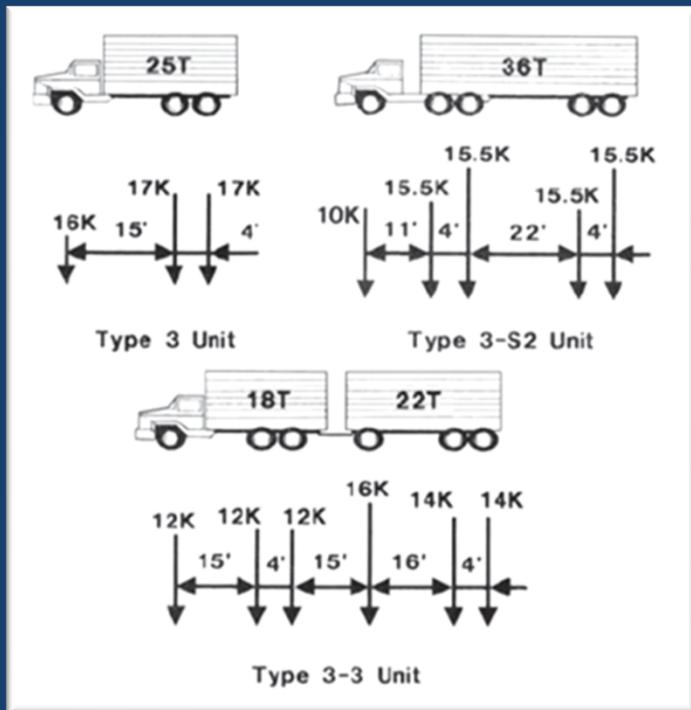
(b) HL-93 Design Tandem



(c) HL-93 Design Lane Load

# Live Load (Legal Level)

## AASHTO Legal Vehicles



## Special Hauling Vehicles



# Capacity & Dead Load

- ▶ Data needed from Plans, Shop Drawings, As-builts
  - ▶ Structure Type
  - ▶ Span Length
  - ▶ Beam Spacing
  - ▶ Cross Sections & Beam Sizes
  - ▶ Material Properties
  - ▶ Reinforcement Size and Locations
  - ▶ Deck Type and Thickness



# Load Rating Intervals

- ▶ Initial Load Rating
  - ▶ During the Design & Construction phase
- ▶ Re-load Rating
  - ▶ Changes in Dead Load Conditions
  - ▶ Deterioration in Structural Elements
  - ▶ Changes in Live Load
  - ▶ Damage

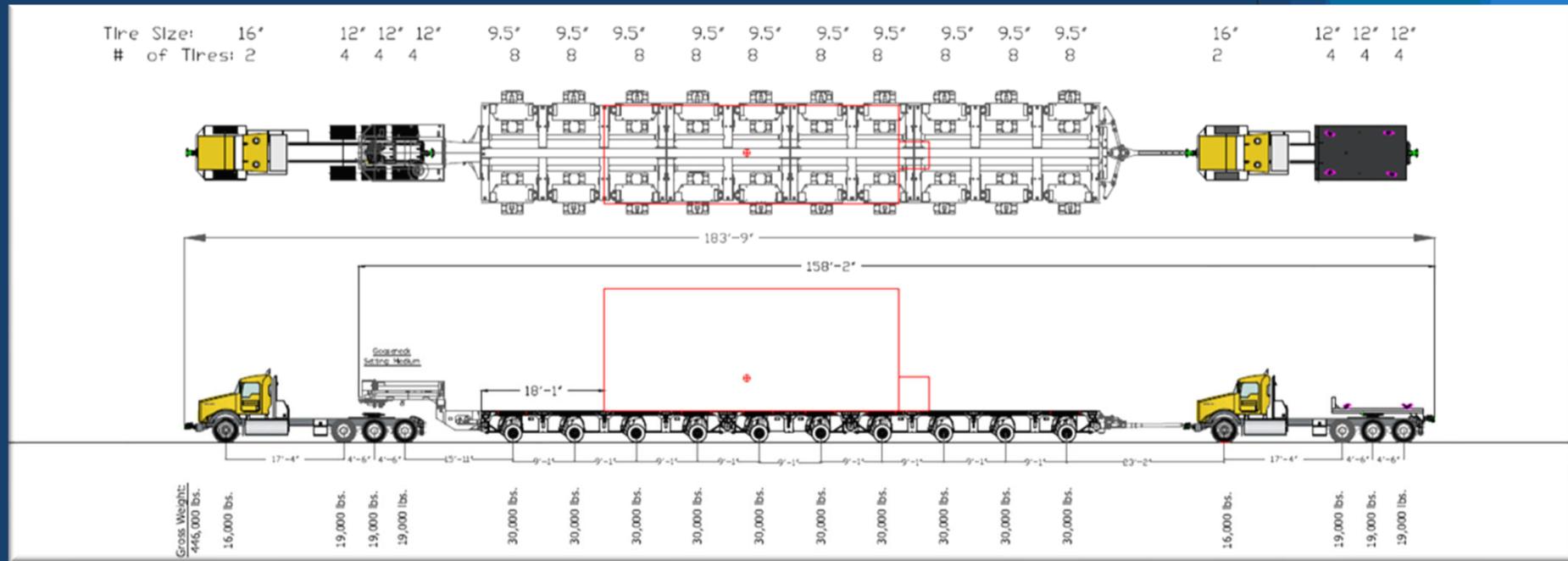


# Permit Load Rating

- ▶ Any load over legal weight must have a permit
  - ▶ 80,000 lbs G.V.W. Interstate
  - ▶ 105,500 lbs G.V.W. on State Highways
- ▶ Each bridge crossed by an Overweight load must be analyzed individually
- ▶ Automated Routing System
  - ▶ Collaboration between Highway Patrol, NDIT, Promiles, and Bridge Division.
  - ▶ 137,500 Permits Issued in 2019

# Super Loads

- ▶ Loads in Excess of 300,000 lbs
- ▶ Non-standard configurations
  - ▶ Greater than 6ft wide
  - ▶ 8 tires per axle
- ▶ 886 Super Load Permits Analyzed by the Bridge Division in 2019



# Wrap-Up

- ▶ Additional Resources
  - ▶ AASHTO Manual for Bridge Evaluation
  - ▶ NDDOT Load Rating Manual



Disclaimer: This is not an approved method of posting bridges in North Dakota.

# Thank You!

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