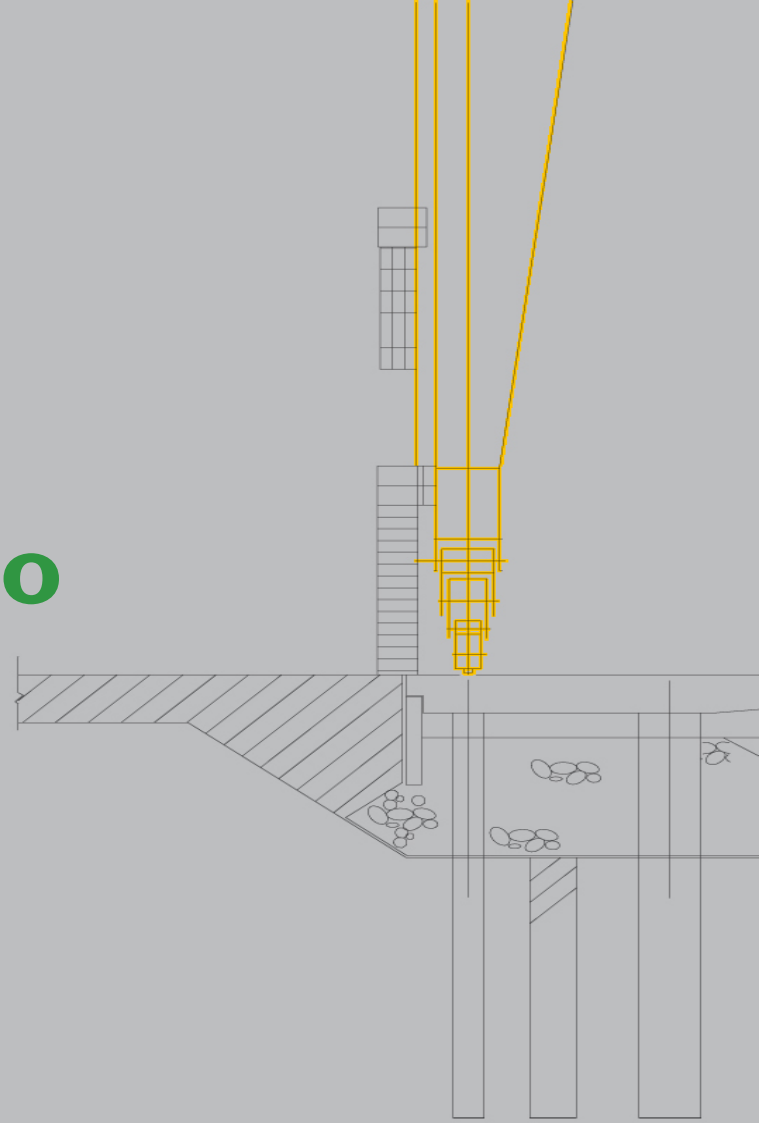




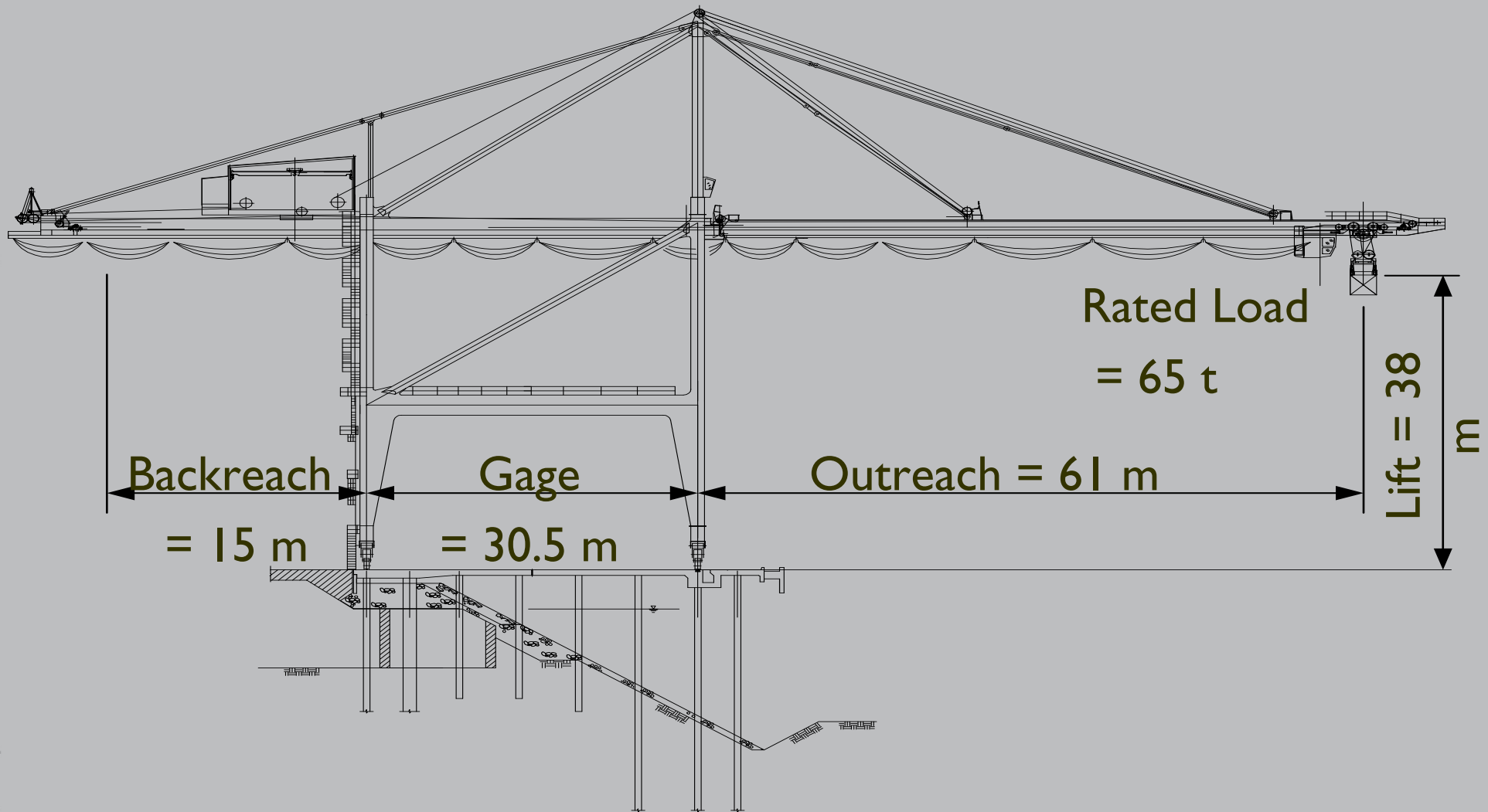
The Impact of Jumbo Cranes on Wharves

Catherine A. Morris, SE
Liftech Consultants Inc.



Liftech

Typical Jumbo Cranes



Jumbo Cranes



Jumbo Cranes

Crane/Wharf Interface

Factors Influencing Crane Loads



Crane's Interface with the Wharf

Crane Runways

Tie Downs

Stowage Brackets

Collision Bumpers

Power



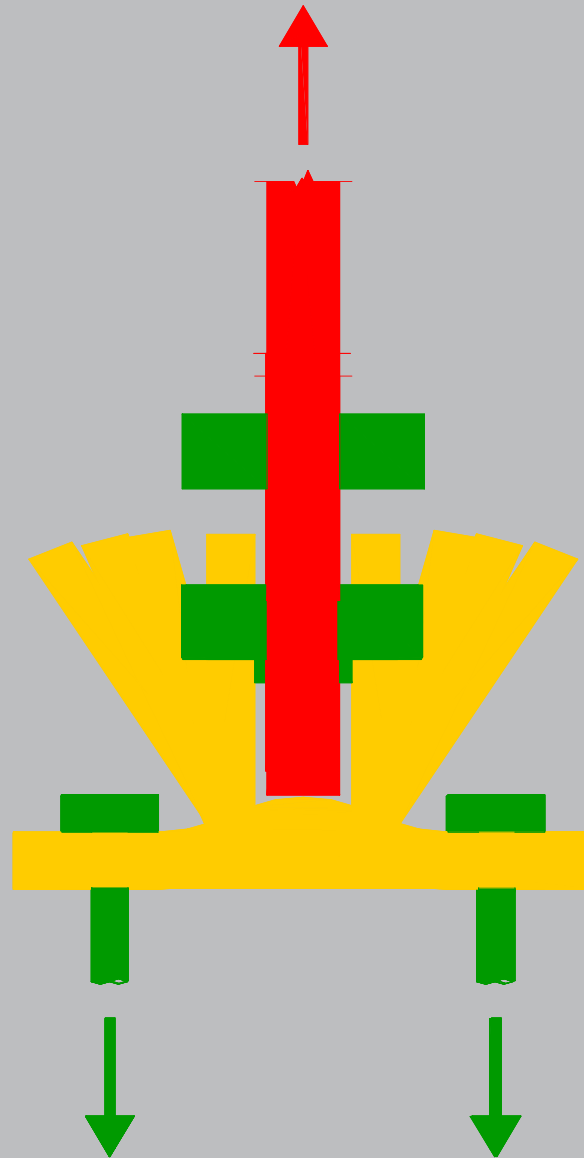
Crane Runways



Tie Downs

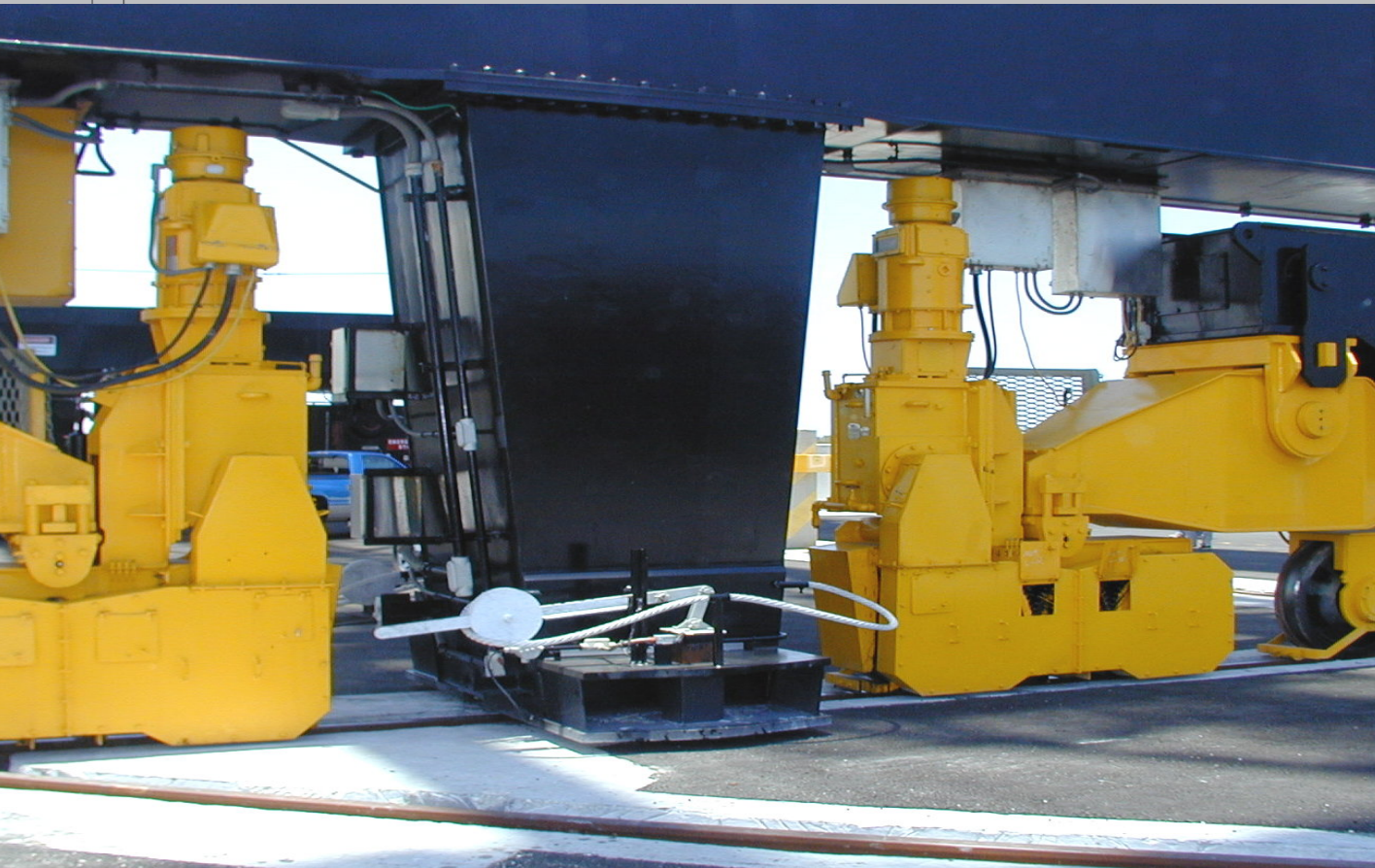


Tie Down Bracket in Wharf

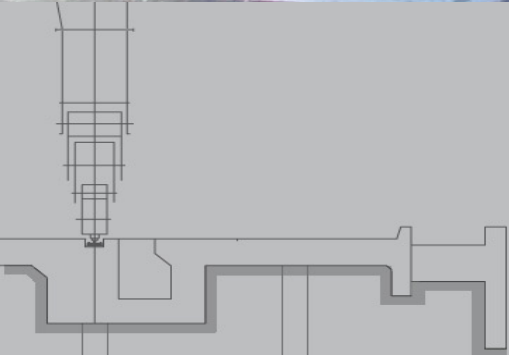


Stowage Brackets

Bracket on Crane



Socket in Wharf

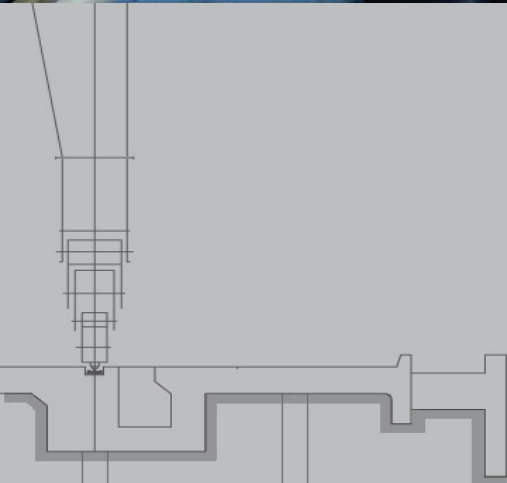


Collision Bumpers



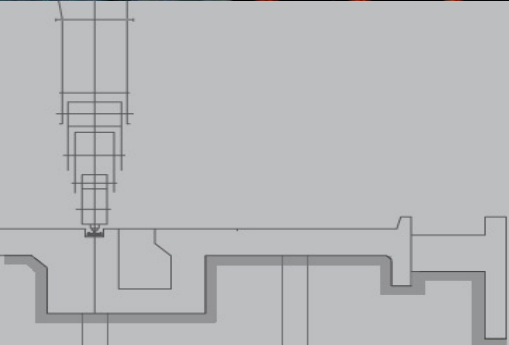
Power

Cable Reel System



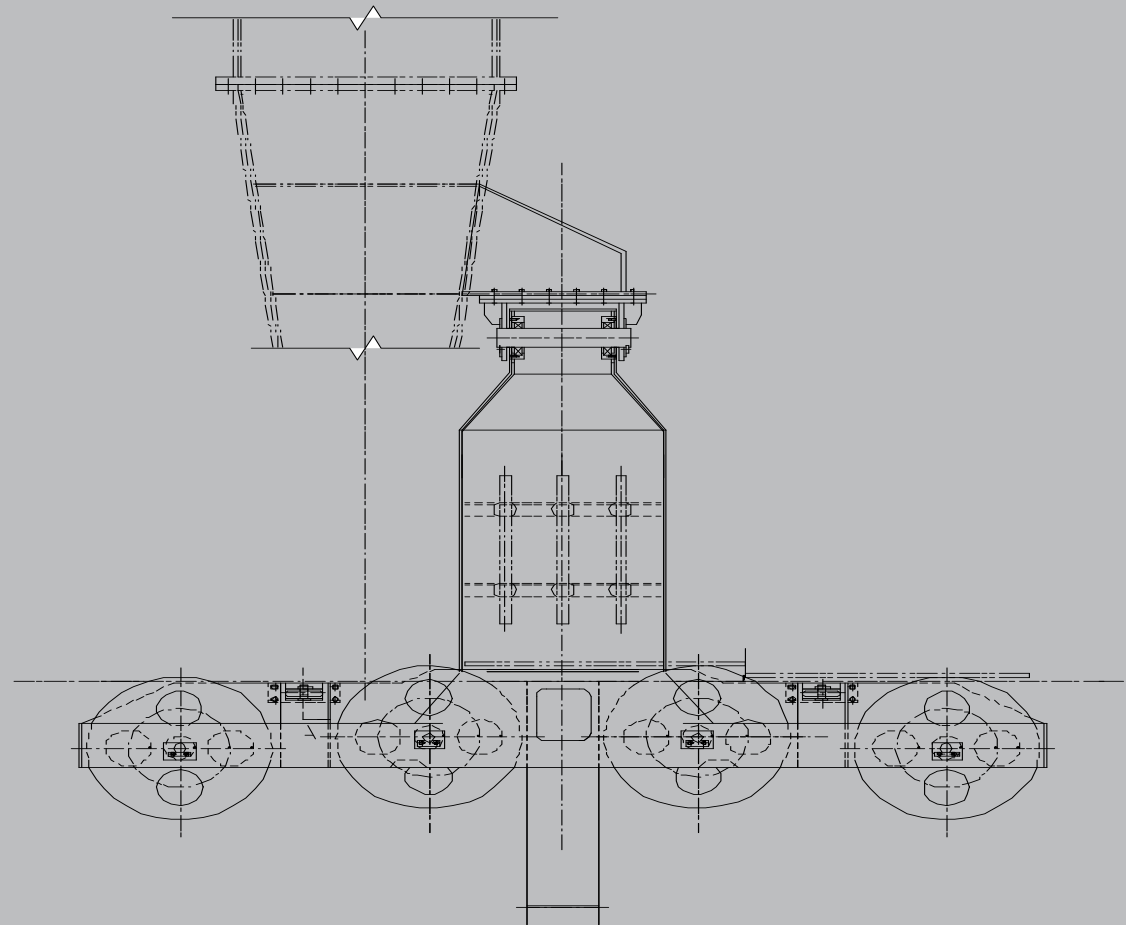
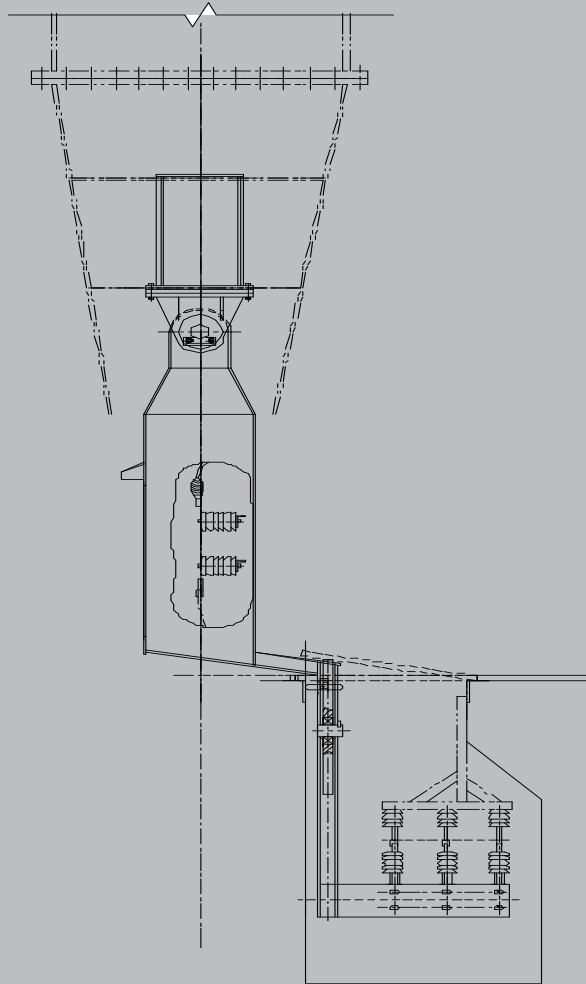
Power

Bus Bar System



Power

Bus Bar System



Factors Influencing Cranes Loads

Capacity

Trolley Type

Height Restriction

Wind Region

The Future



Height Restriction

Articulated Boom



Height = 70 m

Straight Boom, Stowed at 45°



Height = 80 m

Height Restriction

Straight Boom, Stowed at 19°

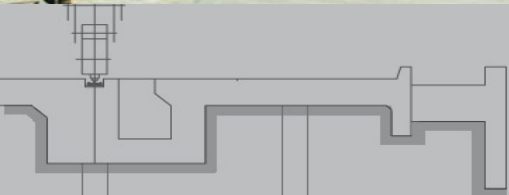


Height = 67 m at Boom
= 64 m at Apex

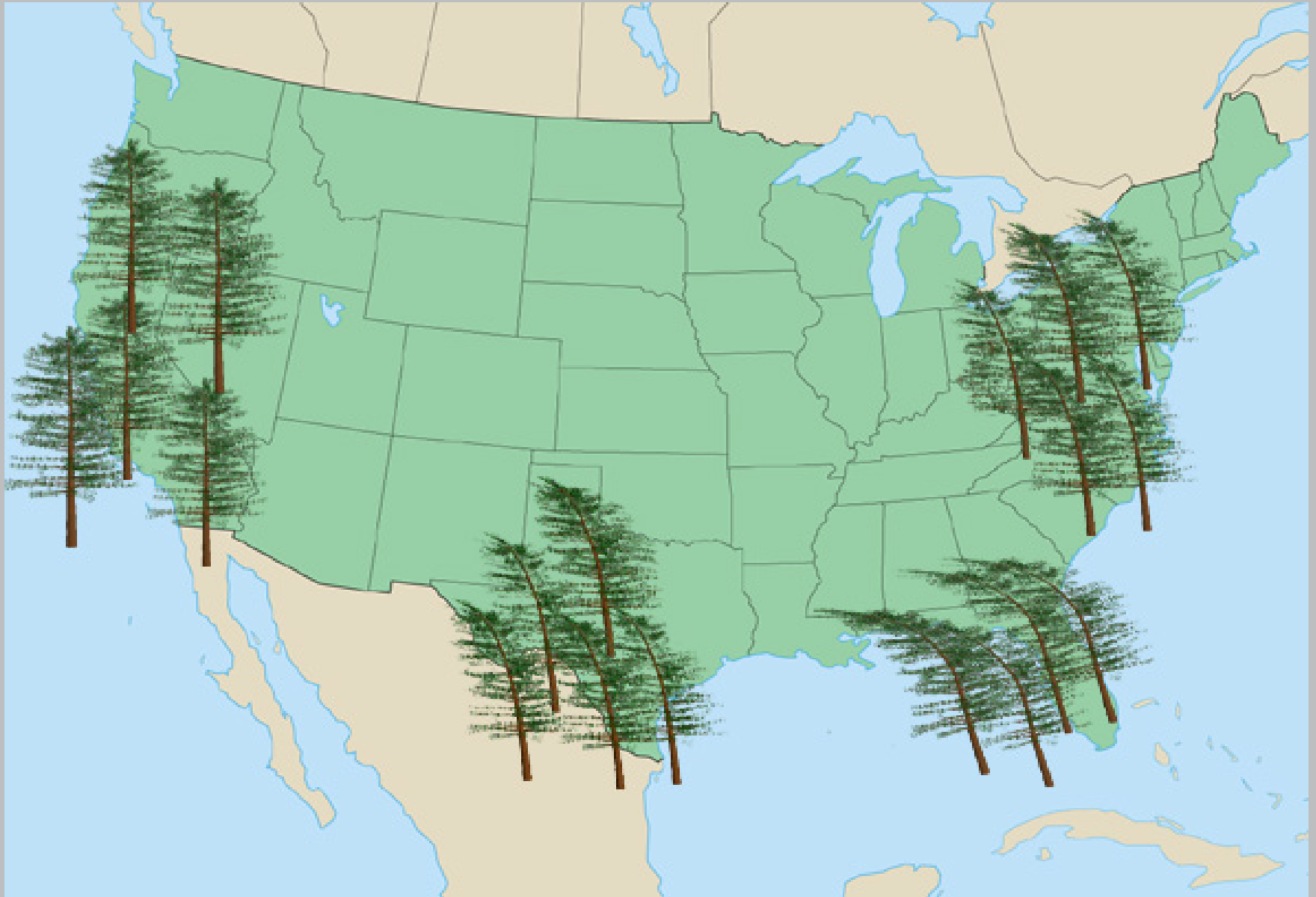
Height Restriction

Low Profile Crane

Height = 46 m



Wind Region



Machinery Trolley



Trolley Weight	65 t
Moving Load	160 t
Crane Weight	1200 t

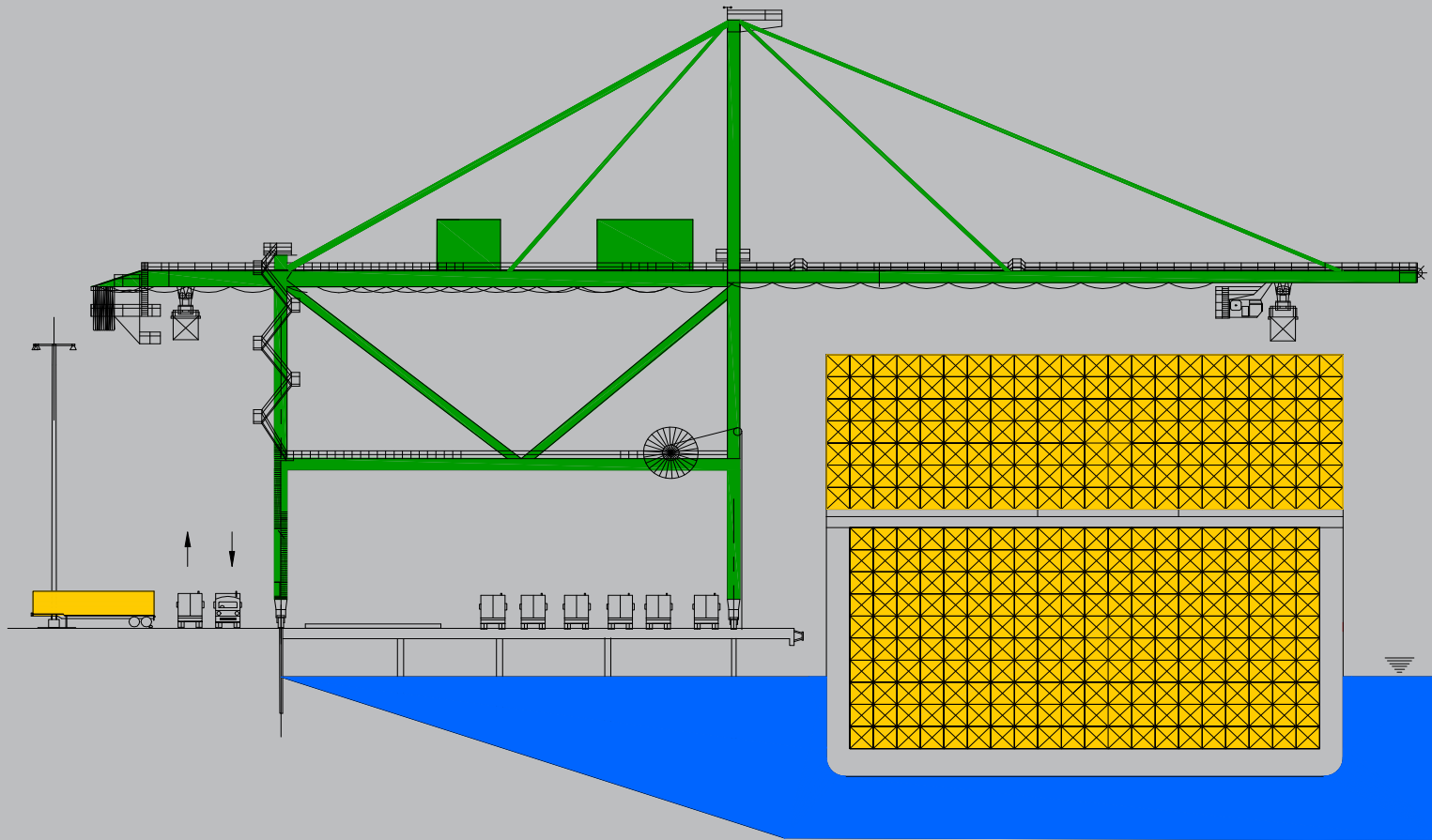
Rope Trolley



Trolley Weight	23 t
Moving Load	110 t
Crane Weight	1050 t

Future Cranes

150' gage cranes?



Conclusion



Thanks for listening!



Crane Loads

Load Factors:

Load Name	Operating	Stowed
Dead Load	1.4	1.05
Trolley Load	1.4	1.05
Lifted Load	1.7	-
Wind Load	1.3	1.3

Wheel Loads (East coast rope trolley crane):

		Factored	Unfactored
Operating	LS	90	60
	WS	130	90
Stowed	LS	100	70
	WS	150	100

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