

# **A Better Low Profile Crane, A Different Boom Articulation, and A Neglected Risk**

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# A Better Low Profile Crane

Recent low profile cranes:

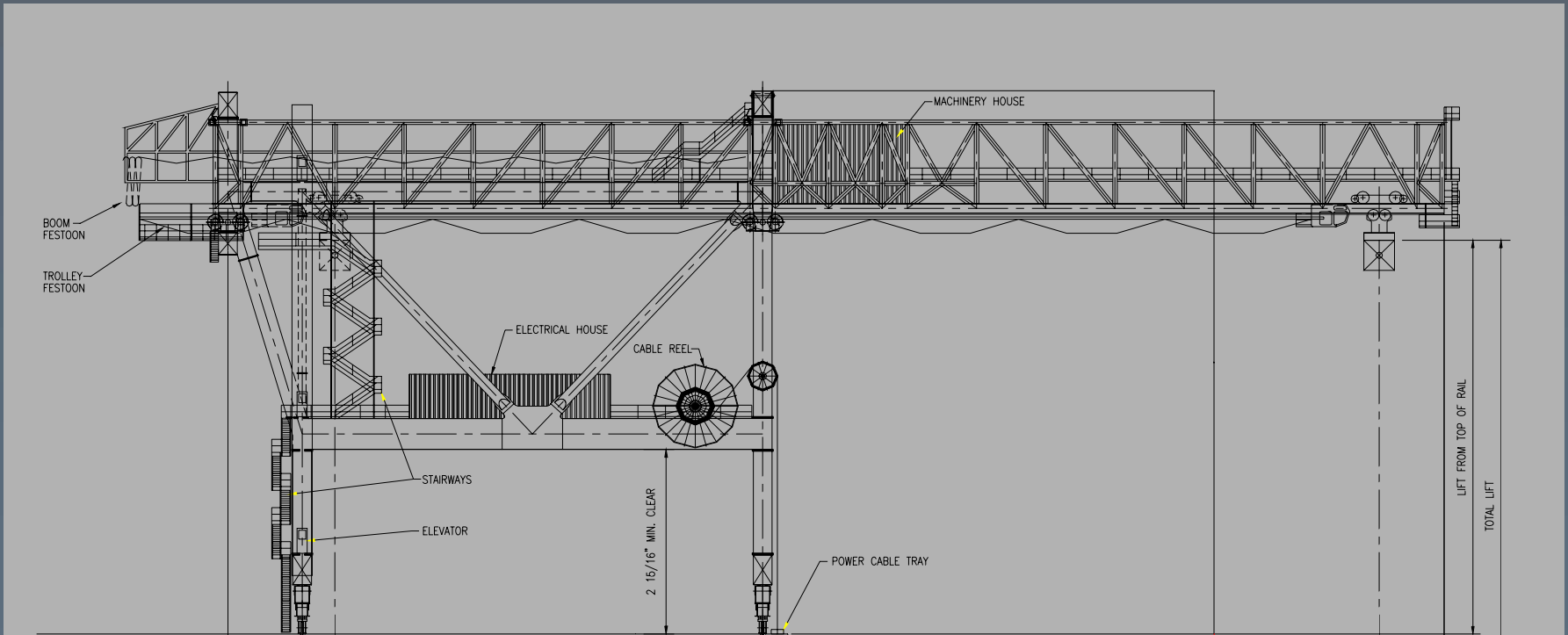
Kocks Oakland

Samsung Everglades

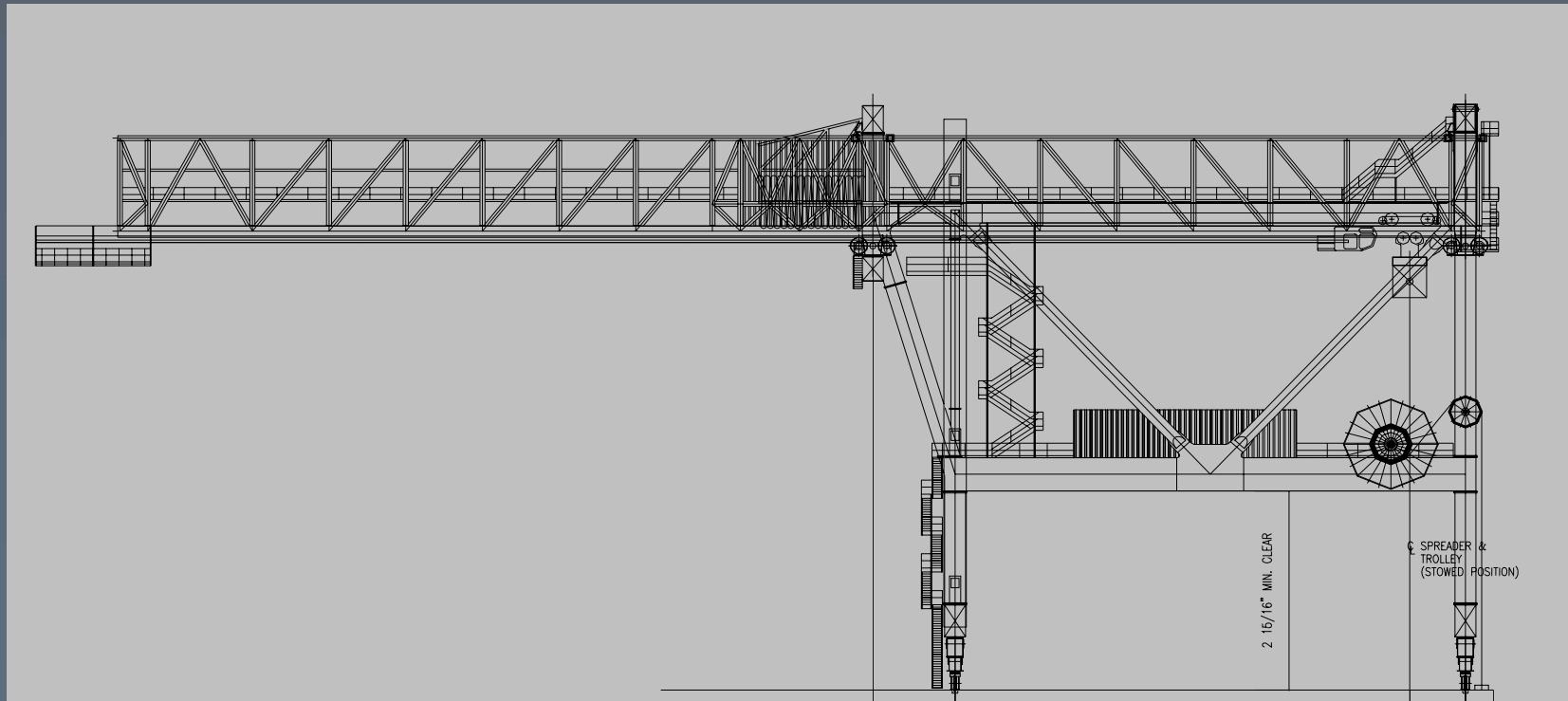
Paceco Boston

Cagliari - a better low profile

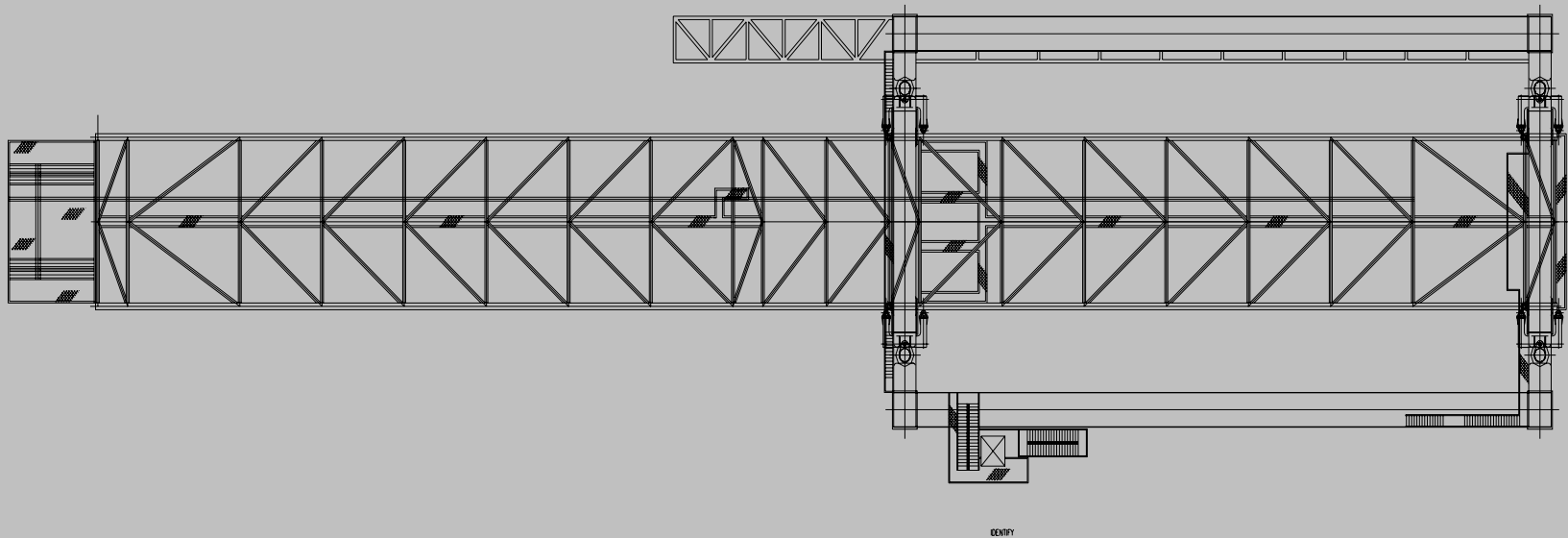
# Cagliari Low Profile Crane



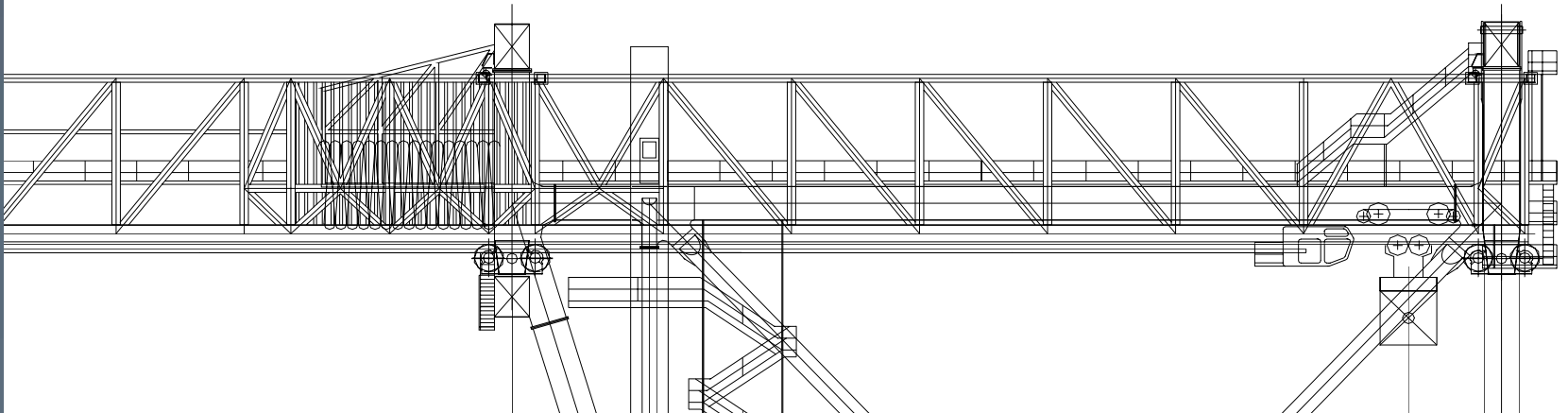
# Boom stowed



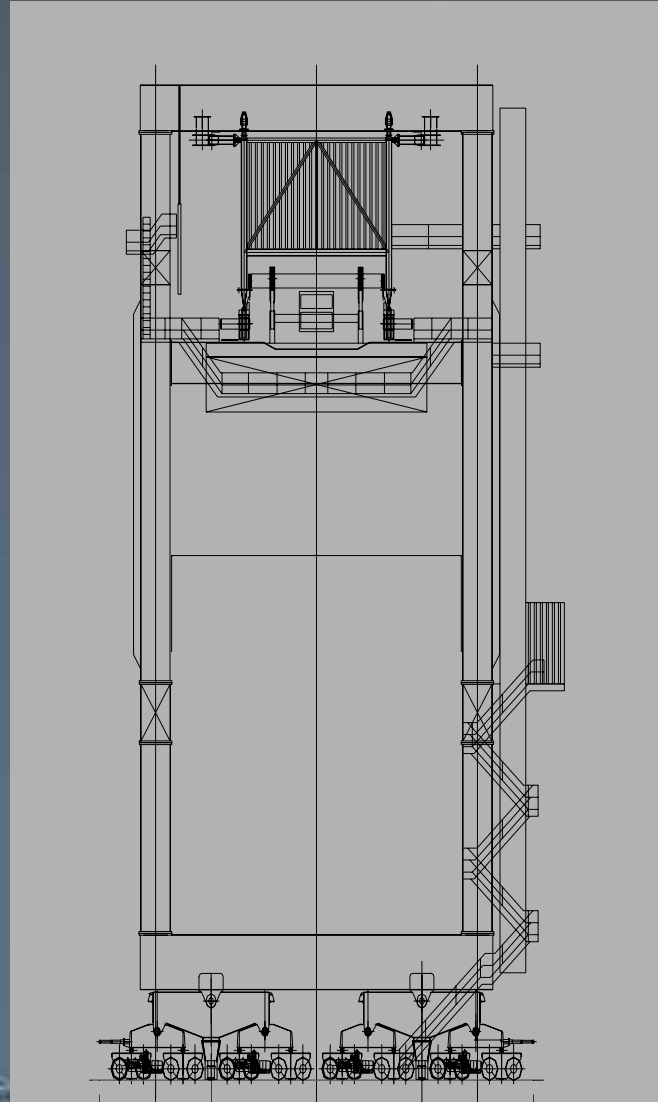
# Plan



# What's special - Landside O-frame Waterside self aligning hangers

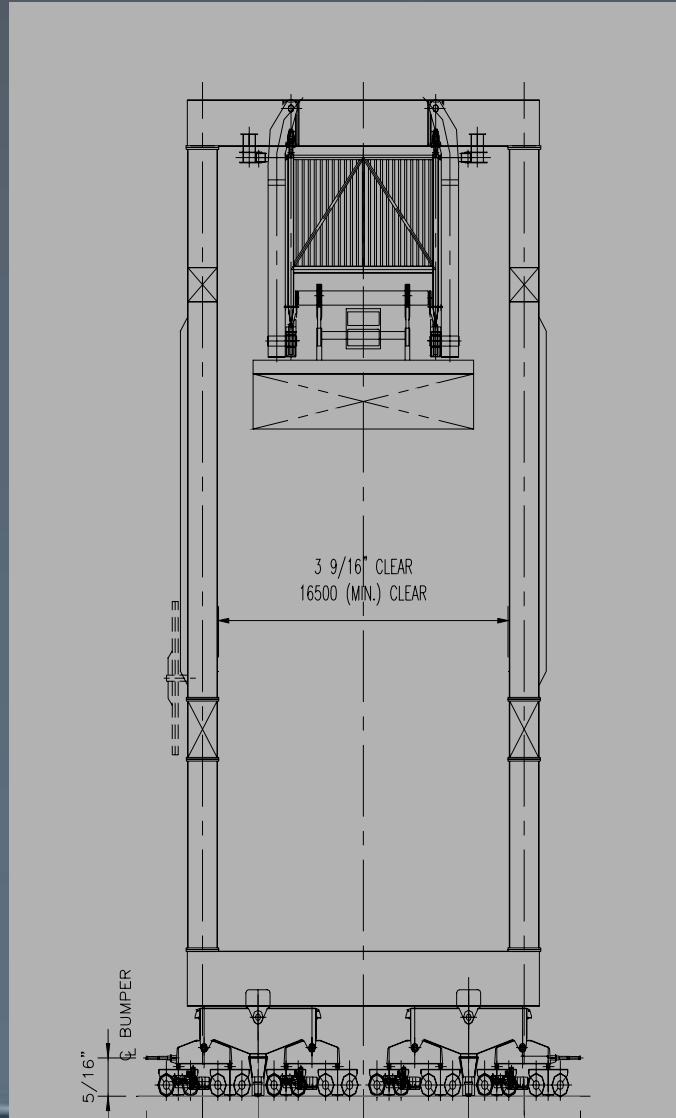


# Landside O-frame



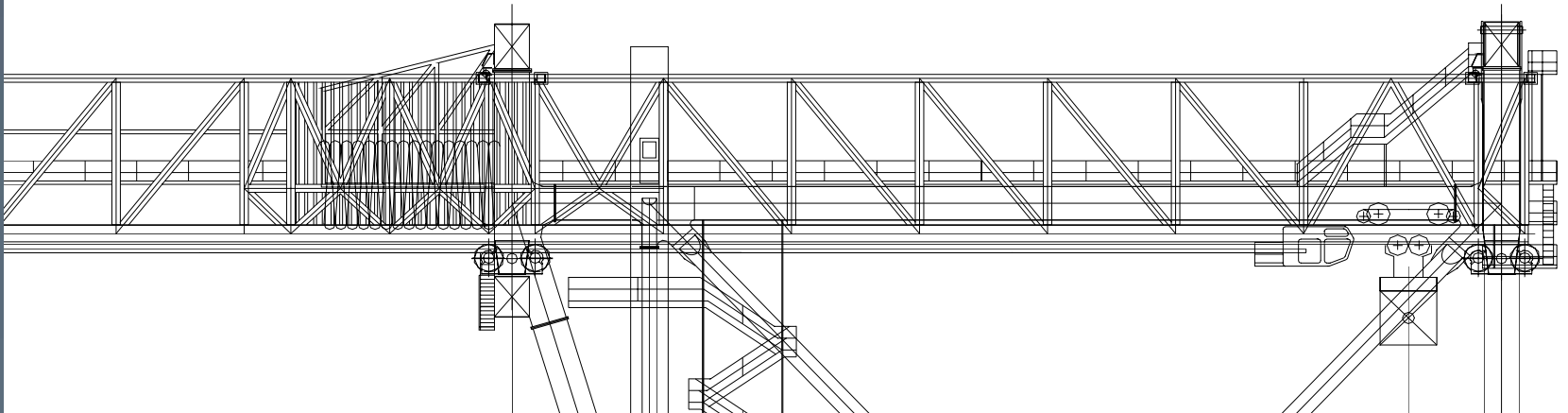


# Waterside hangers

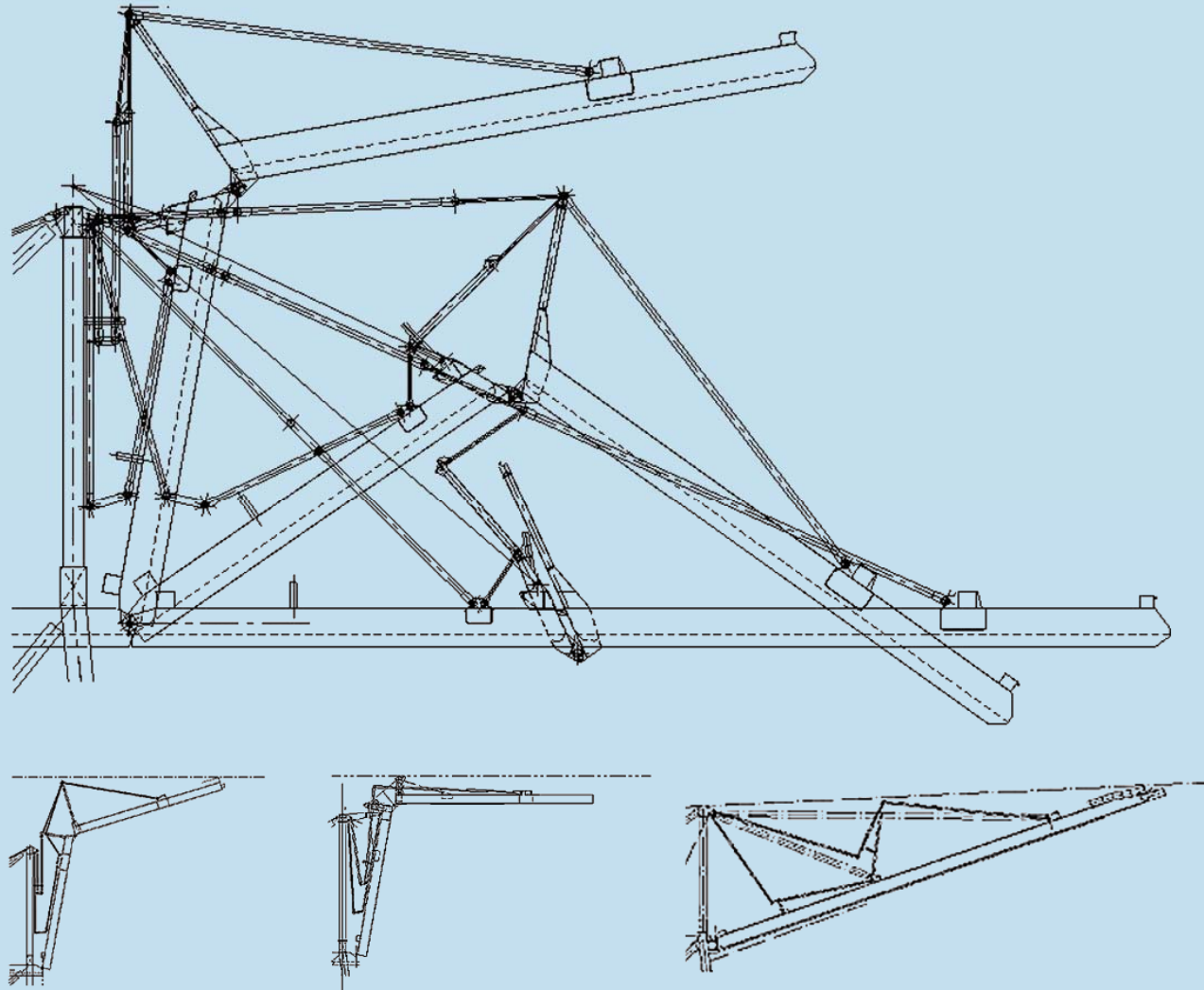




# Landside and waterside frames - Take a second look



# Articulated Booms - Recent projects



# A Neglected Risk - Voyage Bracing



# Voyage bracing issues

Design criteria

Structural design

Fabrication and erection

# What's often wrong

Design criteria

Structural design

Fabrication and erection



# **Solution**

## **Start with good criteria:**

Design for at least a seasonal 10 year return sea state and a 1-minute sustained wind speed, or equivalent, to provide the 5% probability of exceedance of wave height and wind speeds based on the Global Wave Statistics.

This produces a reliability of 0.995 for the voyage forces.

The calculated stress should not exceed 0.80 times yield.



# **Follow through with great care:**

Be as careful with the design, fabrication, and erection as you are with the permanent design.

Check the bracing and the sea bracing.  
Leave no gaps.

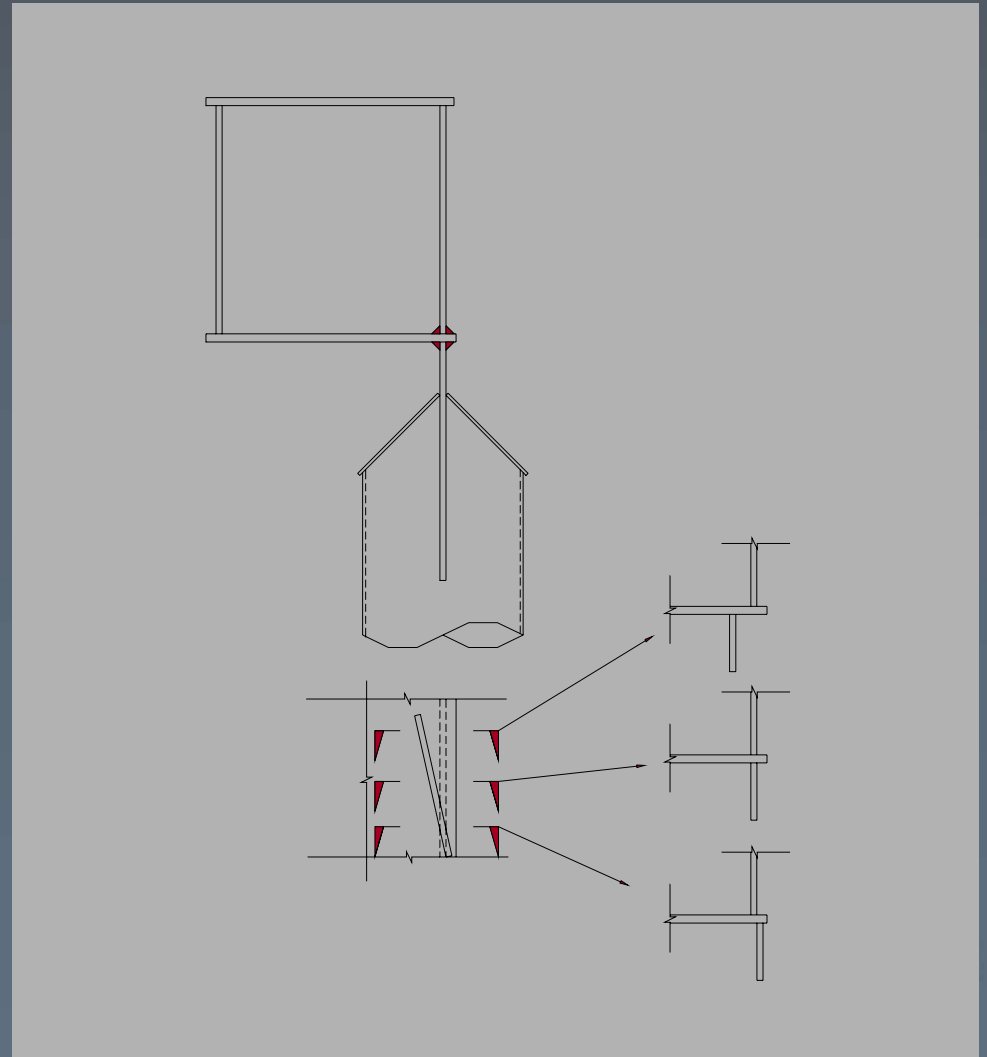
Success or Failure is everyone's business.

# Some typical problems:

**Plates misaligned - just a little**



# Misalignment sketch



# A second look at the as built



# Typical “fixes”





# More “fixes”



# Ragged lifting eye hole

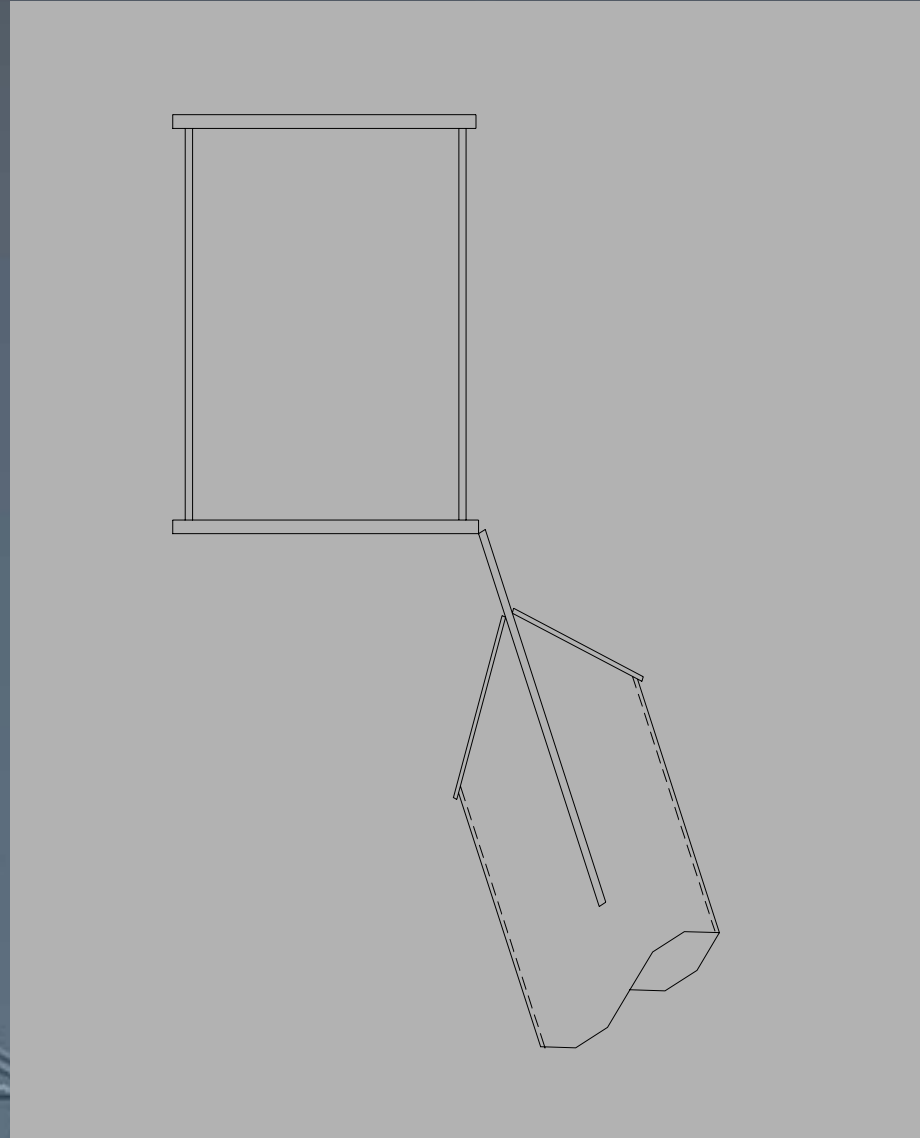




# What's inside?



# Poor attachments



# Inadequate structure



# Tension rods



# How tight?

Rod should not go slack.

This requires calculations.



# What was said:

A new and better low profile crane design exists.

Booms may be articulated using linkages. This is better sometimes.

Voyage bracing is important and should be taken as seriously as the permanent structure.





**Improve your odds**



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