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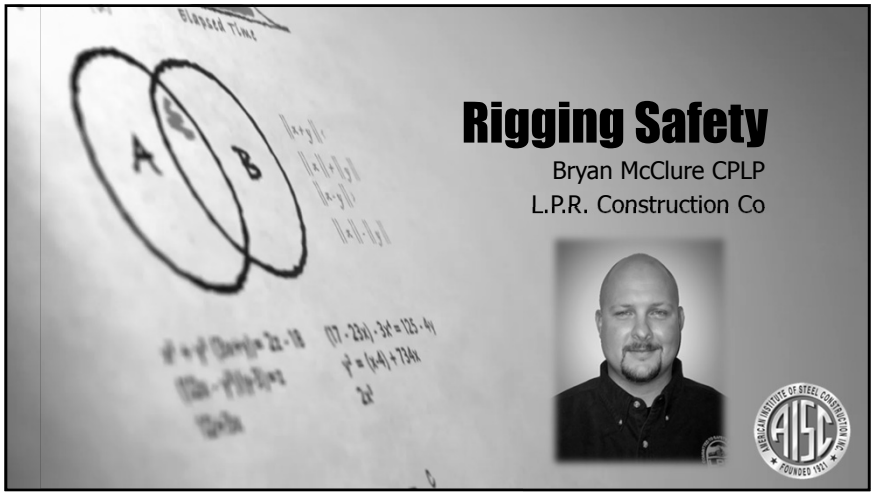

Rigging Safety

Bryan McClure CPLP
L.P.R. Construction Co

OSHA® Occupational Safety and Health Administration

"This presentation is based upon information derived from OSHA publications. Questions and requests for interpretations of this information or these publications should be directed to OSHA. AISC does not endorse any interpretation of these publications other than those interpretations formally issued by OSHA."

Based on OSHA 1910.184

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Objectives

Phase 1

Phase 2

Phase 3

Phase 4

Participants will:

Understand the most commonly used rigging material & hitch types

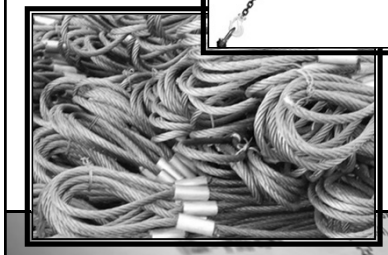
Understand capacity differences in the most commonly used rigging hitch types

Understand what sling stress is

Be able to determine the amount of sling stress placed into a sling

5

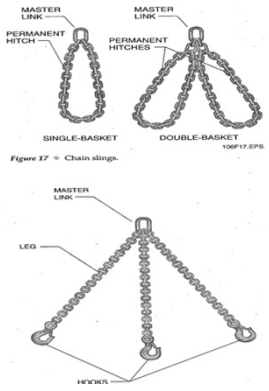
Slings



- Synthetic slings
- Alloy steel chain slings
- Wire rope slings

6

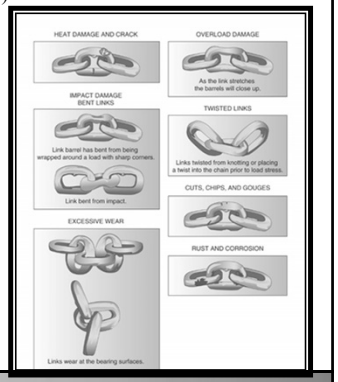
Alloy Steel Chains 1910.184(e)



7

Alloy Steel Chains 1910.184(e)(3)(i)

- **Annual inspections by a competent person are required**
- **Employer shall make and maintain a record of the most recent month in which each alloy steel chain sling was thoroughly inspected**



8

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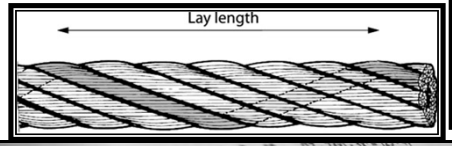
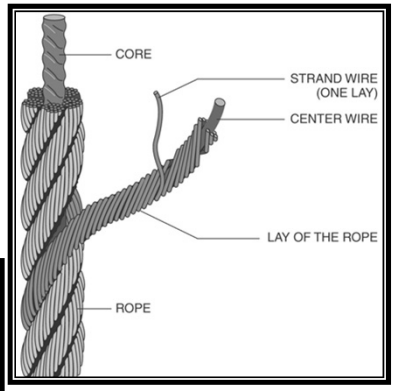
Wire Rope 1910.184f)(5)(i)

Ten randomly distributed broken wires in one rope lay, or five broken wires in one strand in one rope lay.

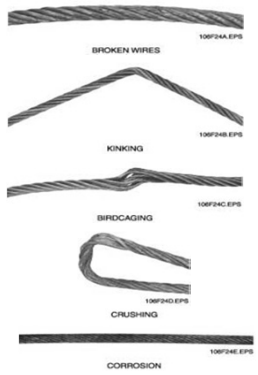




9

Wire Rope 1910.184f)(5)(i)

- **Kinking**
- **Crushing**
- **Bird Caging**
- **Heat Damage**



10

Synthetic Slings 1910.184(i)(1)

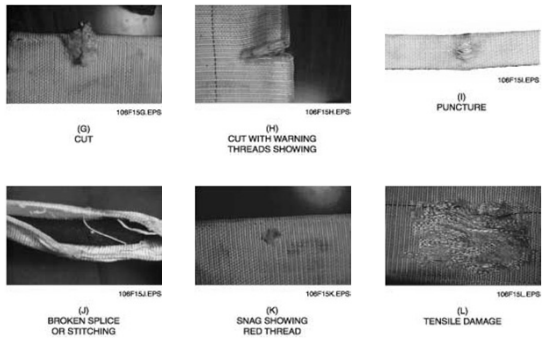
Marked or coded to show the rated capacities

11

Synthetic Slings 1910.184(i)(9)

Removal from Service if any of the following are present:

- **Burns**
- **Snags, tears punctures or cuts**
- **Broken/worn stitches**



12

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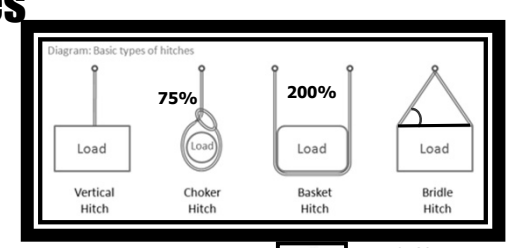
Synthetic Slings

Always use softeners when rigging around sharp edges

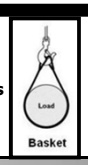
13

Hitch Types

Vertical
Choker Hitch
Basket Hitch
Bridle Hitch



@ 60 Degrees 173%

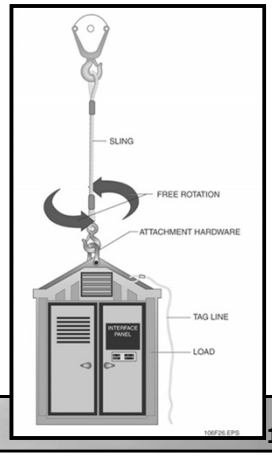


@ 60 Degrees 173%

14

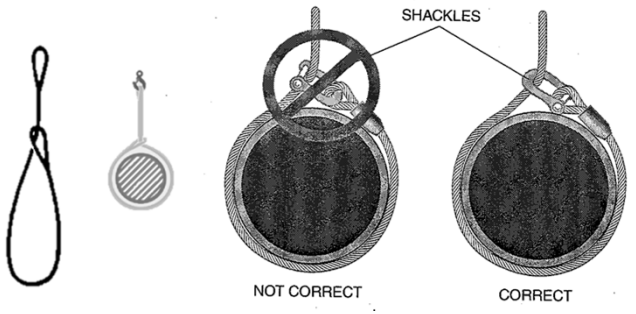
Vertical Hitch

Forms a 90 degree angle between the hitch and the load.



15

Choker Hitch



16

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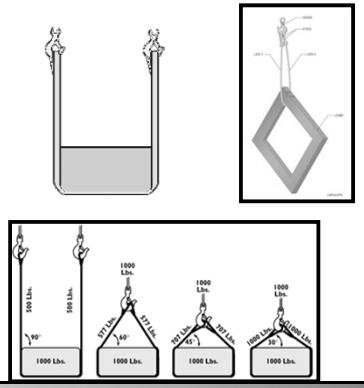
Basket Hitch

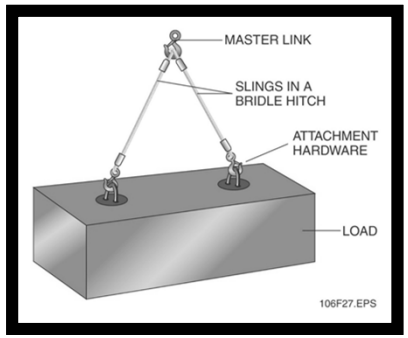
A basket hitch with both legs at 90 degrees effectively doubles the capacity of the sling



17

Bridle Hitch

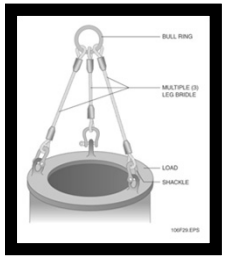
The bridle hitch consists of two or more vertical hitches attached to the same hook, master link, or bull ring.

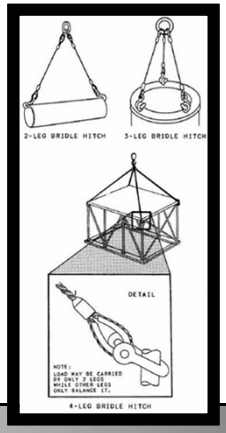


18

Multiple Leg Bridle Hitch

A multiple leg bridle hitch is always considered to have only two of the legs supporting the majority of the load and the rest of the legs balancing it.





19

Sling Stress

Sling Stress

The total amount of force exerted on a sling. This includes forces added as a result of sling angle. Sling stress applies to all types of slings.

Sling Angle

The angle of an attached sling when pulled in relation to the load

20

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Sling Stress

Two buckets of water weighing 40 LBS

21

Sling Stress

@ 30 degrees from horizontal = 80 LBS

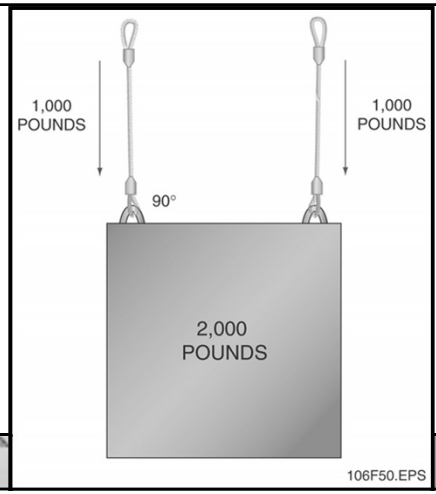
21

Sling Stress

@ 5 degrees from horizontal = 240 LBS

21

Sling Stress



22

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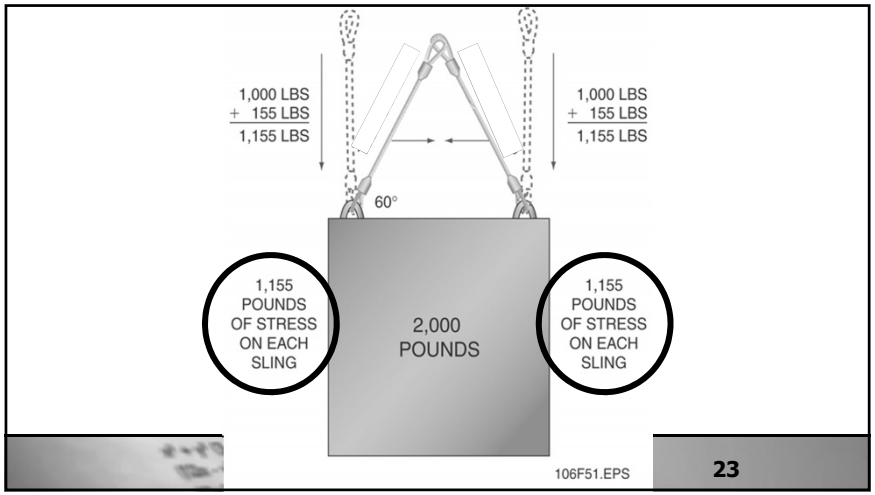
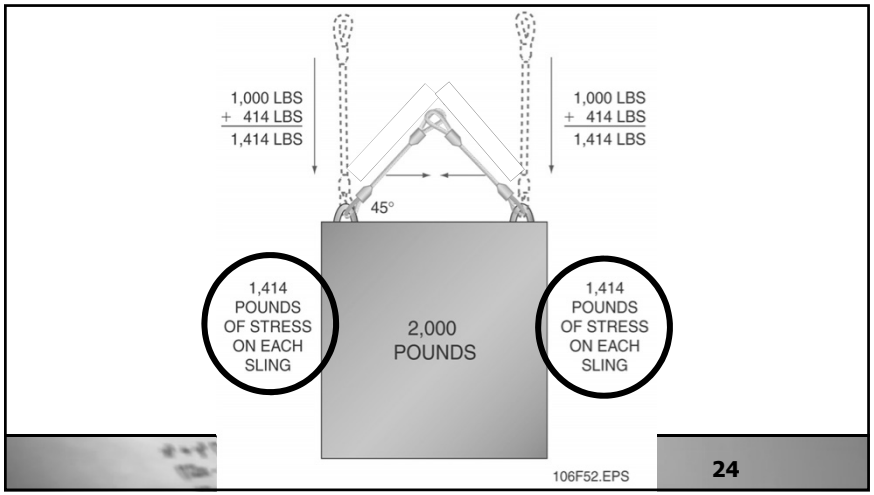
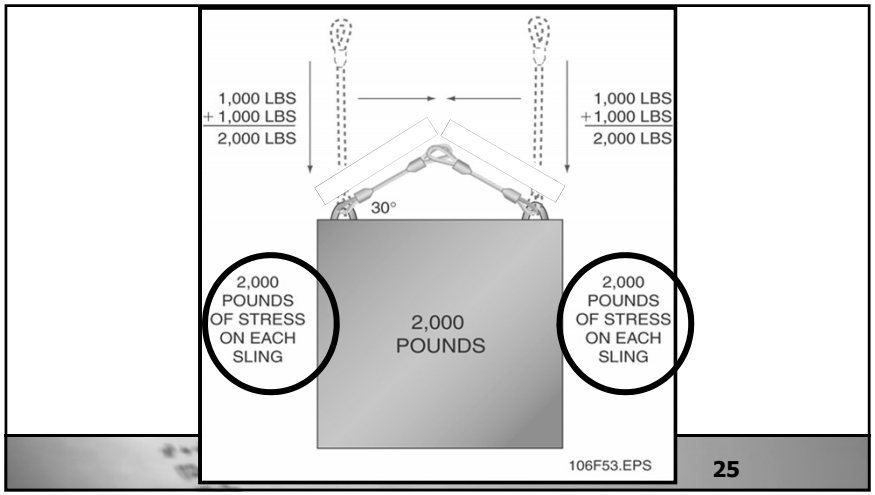
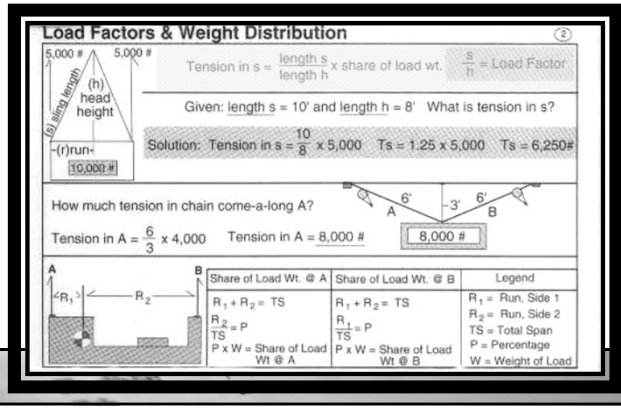






How to determine sling tension



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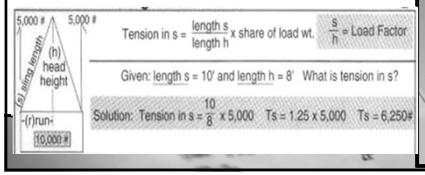
Activity

Determine sling Tension

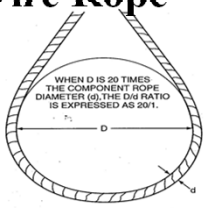
Length of sling= 30 feet
Height from load= 25 feet
Total load weight= 100,000 lbs

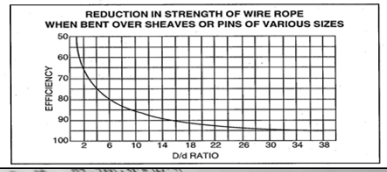
What is the sling tension in each sling?



27

D/d Ratio For Wire Rope Slings





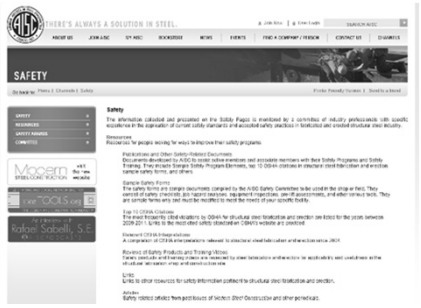
28

Questions? More Information?

bmcclure@lprconstruction.com

Safety Resources

- AISC Safety Website – www.aisc.org/safety
- Sample Safety Program Elements
- Safety Awards Program
- Sample Safety Forms
- Top 10 OSHA Citations
- OSHA Interpretations
- Safety Product Reviews
- Safety Details or 'Tool Box Talks'
- Daily Safety Focus
- And more



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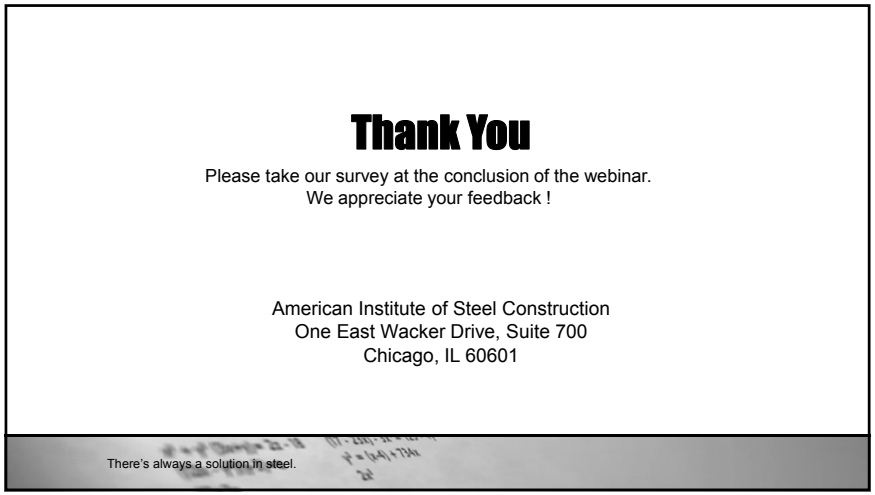

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