Crane & Rigging Brain Teasers

Host: Mike Parnell

President/CEO, ITI

ASME B30 Vice Chair (Cranes & Rigging)

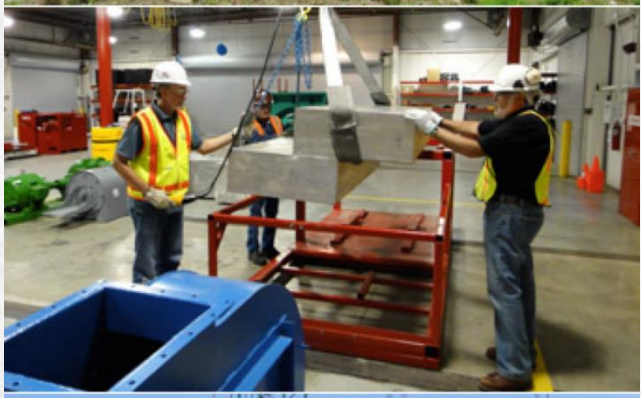
ASME P30 Chair (Lift Planning)

The views expressed in this presentation are that of ITI and are not necessarily the views of the ASME or any of its committees

WHO WE ARE

A world leader in crane and rigging training and consulting.

We Rig It Right!



CRANE AND RIGGING RESOURCES

iti.com/crane-rigging-resources

- ASME Interpretations
- Blogs
- ITI Bookstore Catalog
- Info Kits, Whitepapers, and eBooks
- Cost of Training Worksheet
- Cross-Industry Education
- E-Learning Demo Videos
- Lift Count Calculator
- ITI Newsroom
- And More!

We Rig It Right!

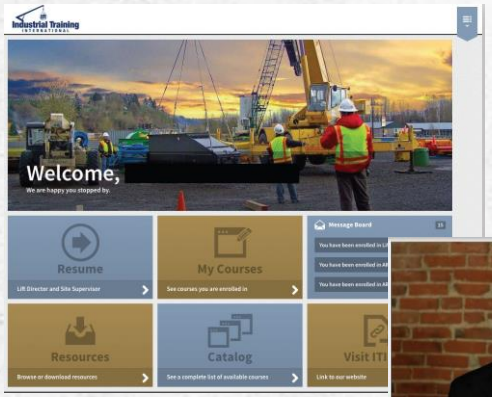
COMING SOON

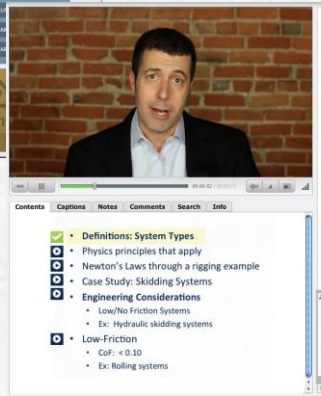
FUNDAMENTALS OF RIGGING ENGINEERING

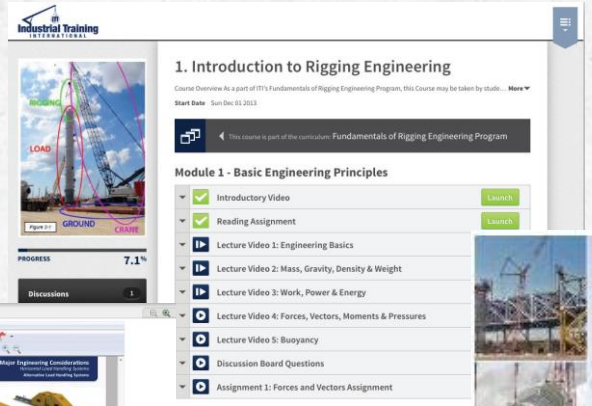
Comprehensive Training Program That Prepares Key Personnel With Foundational Knowledge Of Rigging Engineering

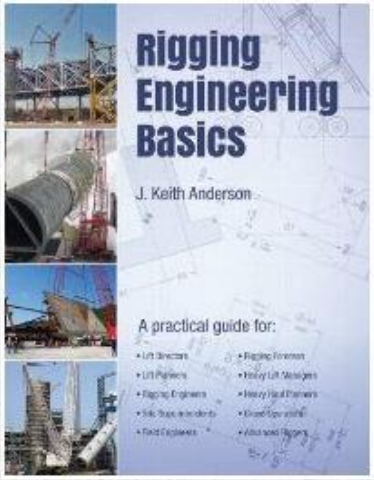
Program eBook Now Available!

www.riggingengineering.com









MIKE PARNELL – ABOUT YOUR HOST

Mr. Parnell has a wealth of knowledge regarding cranes, rigging, and lifting activities throughout a variety of industries.

- 30+ years learning about wire rope, rigging, load handling, and lifting activities.
- Vice Chair of the ASME B30 Main Committee which sets the standards in the US for cranes and rigging
- Chair of the ASME P30 Main Committee which sets the standards for lift planning.

ASME standards are also adopted by many countries around the world.

The views expressed in this presentation are that of ITI and are not necessarily the views of the ASME or any of its committees.

LET THE GAMES BEGIN

https://www.surveymonkey.com/s/itimay

- 30 Questions
- 10 - 20 Seconds of “Answer Time” (Based on Difficulty)
- Explanation of Answer after each Question
- Three Top Scores earn a $50 Coupon to the ITI Bookstore

1. Which of the following is NOT a proper method for determining the weight of an object to be lifted?

A. Check the maintenance manual
B. Calculate the weight
C. Check nameplate data
D. Guess the weight

1. Which of the following is NOT a proper method for determining the weight of an object to be lifted?

A. Check the maintenance manual
B. Calculate the weight
C. Check nameplate data
✓ D. Guess the weight

2. What type of damage is not likely to occur with wire ropes slings?

A. Ultraviolet ray degradation
B. Broken wires
C. Corrosion
D. Severe metal loss

2. What type of damage is not likely to occur with wire ropes slings?

- A. Ultraviolet ray degradation
- B. Broken wires
- C. Corrosion
- D. Severe metal loss

3. When lifting a uniform load of 2000 lbs. with two slings rigged at 60 degrees from the horizontal plane, approximately how many pounds of tension are on each leg?

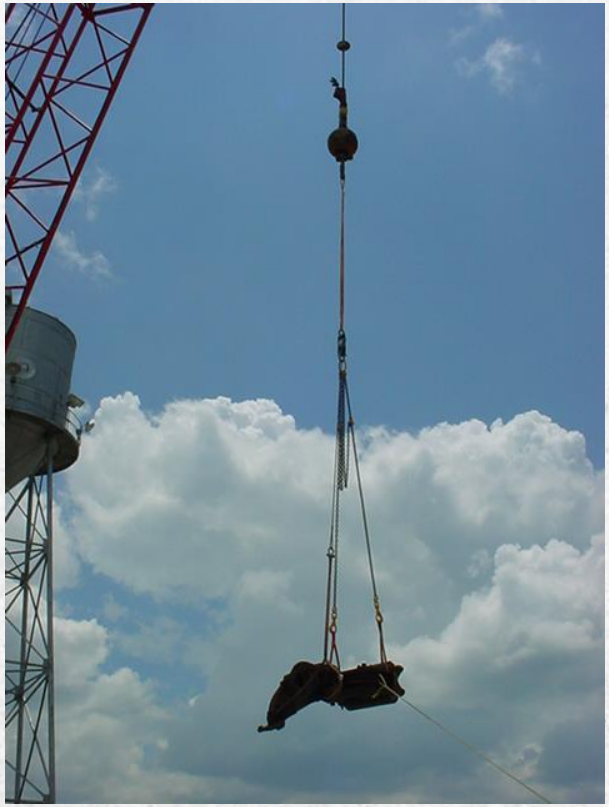
A. 1,000 lbs
B. 1,155 lbs
C. 2,000 lbs
D. 11,490 lbs

3. When lifting a uniform load of 2000 lbs. with two slings rigged at 60 degrees from the horizontal plane, approximately how many pounds of tension are on each leg?

A. 1,000 lbs
✓ B. 1,155 lbs
C. 2,000 lbs
D. 11,490 lbs

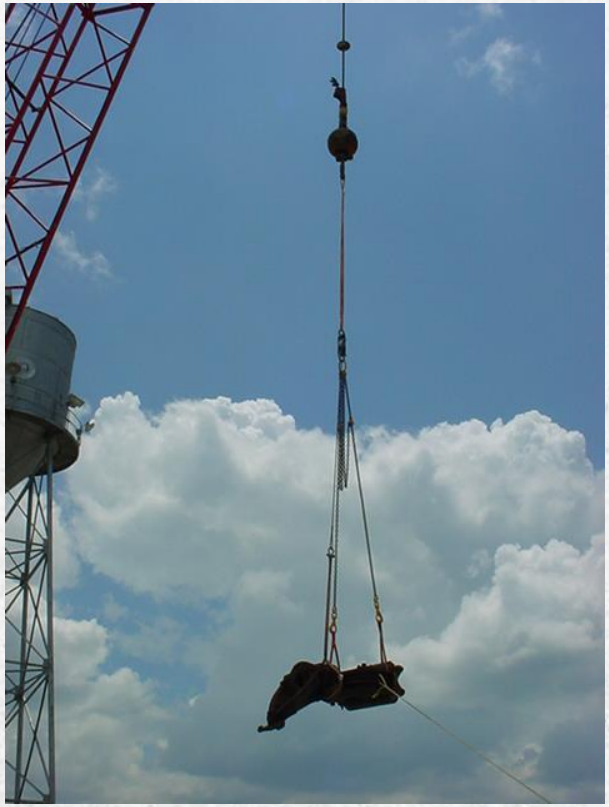
4. The normal design factor for a 6 strand wire rope used as a hoist rope on a mobile crane is _____.

A. 2.5:1
B. 3.0:1
C. 3.5:1
D. 5.0:1



4. The normal design factor for a 6 strand wire rope used as a hoist rope on a mobile crane is _____.

A. 2.5:1
B. 3.0:1
C. 3.5:1
D. 5.0:1



5. Two blocking with a mobile crane can occur while _____.

A. Retracting the boom
B. Extending the boom
C. Booming up
D. None of the above

5. Two blocking with a mobile crane can occur while _____.

A. Retracting the boom
✓ B. Extending the boom
C. Booming up
D. None of the above

6. How much tension is added to a sling if used at a 30 degree angle from the horizontal plane?

A. 15%
B. 40%
C. 100%
D. 25%

6. How much tension is added to a sling if used at a 30 degree angle from the horizontal plane?

A. 15%
B. 40%
✓ C. 100%
D. 25%

7. Compared to a web sling, a chain sling is well suited to lift ____ loads.

A. Slippery
B. 500°F
C. Delicate
D. Large

7. Compared to a web sling, a chain sling is well suited to lift ____ loads.

A. Slippery
✓ B. 500°F
C. Delicate
D. Large

8. Wire ropes on overhead and gantry cranes should be replaced when the inspector finds _____ randomly distributed broken wires in one rope lay, or ___ broken wires in one strand in one rope lay.

A. 20, 14
B. 15, 8
C. 12, 4
D. 9, 7

8. Wire ropes on overhead and gantry cranes should be replaced when the inspector finds _____ randomly distributed broken wires in one rope lay, or ___ broken wires in one strand in one rope lay.

A. 20, 14
B. 15, 8
✓ C. 12, 4
D. 9, 7

9. The point of an object about which all its parts are balanced and its mass is concentrated is its:

A. Load center
B. Mid-weight
C. Center of gravity
D. Center line

9. The point of an object about which all its parts are balanced and its mass is concentrated is its:

A. Load center
B. Mid-weight
✓ C. Center of gravity
D. Center line

10. When a load or stress breaks a piece of rigging equipment, that piece has reached its:

A. Maximum safety limit
B. Minimum rated capacity
C. Working load limit
D. Breaking strength

10. When a load or stress breaks a piece of rigging equipment, that piece has reached its:

A. Maximum safety limit
B. Minimum rated capacity
C. Working load limit
✓ D. Breaking strength

11. What hand signal shall a crane operator take from anyone?

A. Hoist
B. Stop
C. Lower
D. Travel

11. What hand signal shall a crane operator take from anyone?

A. Hoist
✓ B. Stop
C. Lower
D. Travel

12. When using one chain fall or one come-along in a four-part pick, how much of the load should each part (leg) be able to support?

A. 25%
B. 50%
C. 75%
D. 100%

12. When using one chain fall or one come-along in a four-part pick, how much of the load should each part (leg) be able to support?

A. 25%
✓ B. 50%
C. 75%
D. 100%

13. When using nylon slings, all sharp corners of the load should be padded to prevent:

A. Slippage of the load
B. Rotation of the load
C. Damage to the sling
D. Rotation of the sling

13. When using nylon slings, all sharp corners of the load should be padded to prevent:

A. Slippage of the load
B. Rotation of the load
✓ C. Damage to the sling
D. Rotation of the sling

14. While inspecting shackles prior to use:

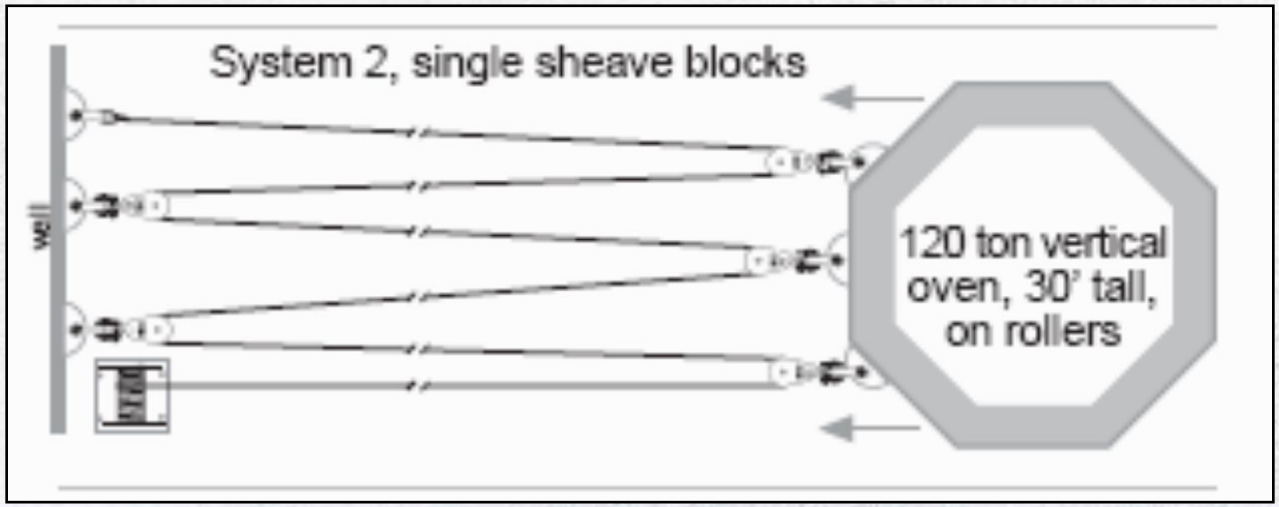
A. Any cracks found should be repaired
B. Bound shackle pins should be tightened
C. Irregular-shaped shackles should be bent back into shape
D. Shackles with damaged threads should not be used.

14. While inspecting shackles prior to use:

A. Any cracks found should be repaired
B. Bound shackle pins should be tightened
C. Irregular-shaped shackles should be bent back into shape
✓ D. Shackles with damaged threads should not be used.

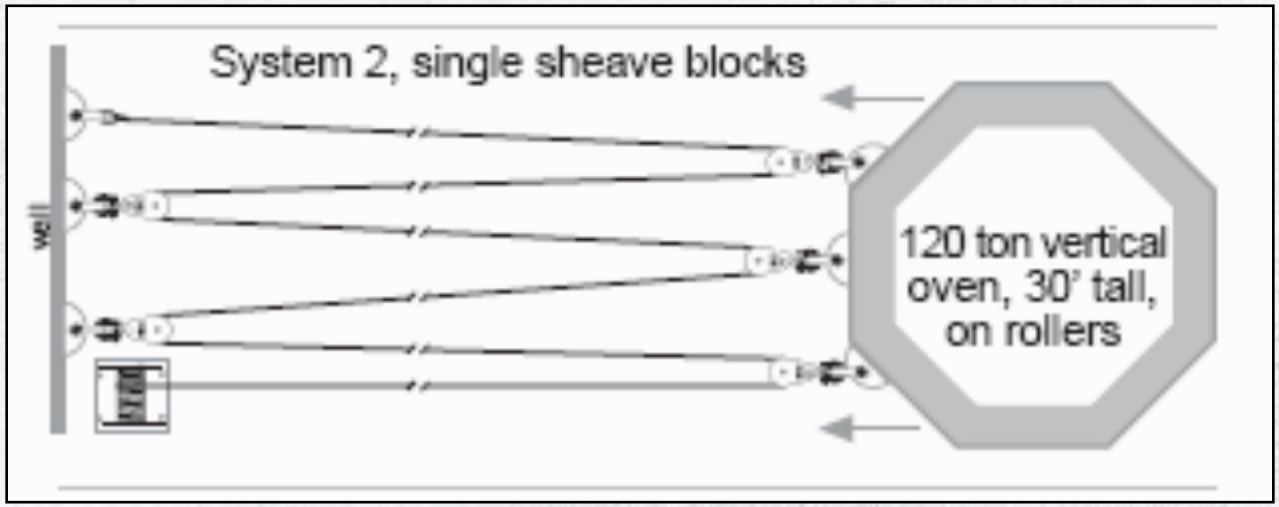
15. The rated load of a rigging block is based on the _____.

A. Pounds of pull on the winch line side of the sheave
B. Primary load fitting
C. Pounds of pull on the load side of the sheave
D. Sheave diameter



15. The rated load of a rigging block is based on the _____.

A. Pounds of pull on the winch line side of the sheave
B. Primary load fitting
C. Pounds of pull on the load side of the sheave
D. Sheave diameter



16. As the sling angle gets closer to vertical, the amount of stress on the sling:

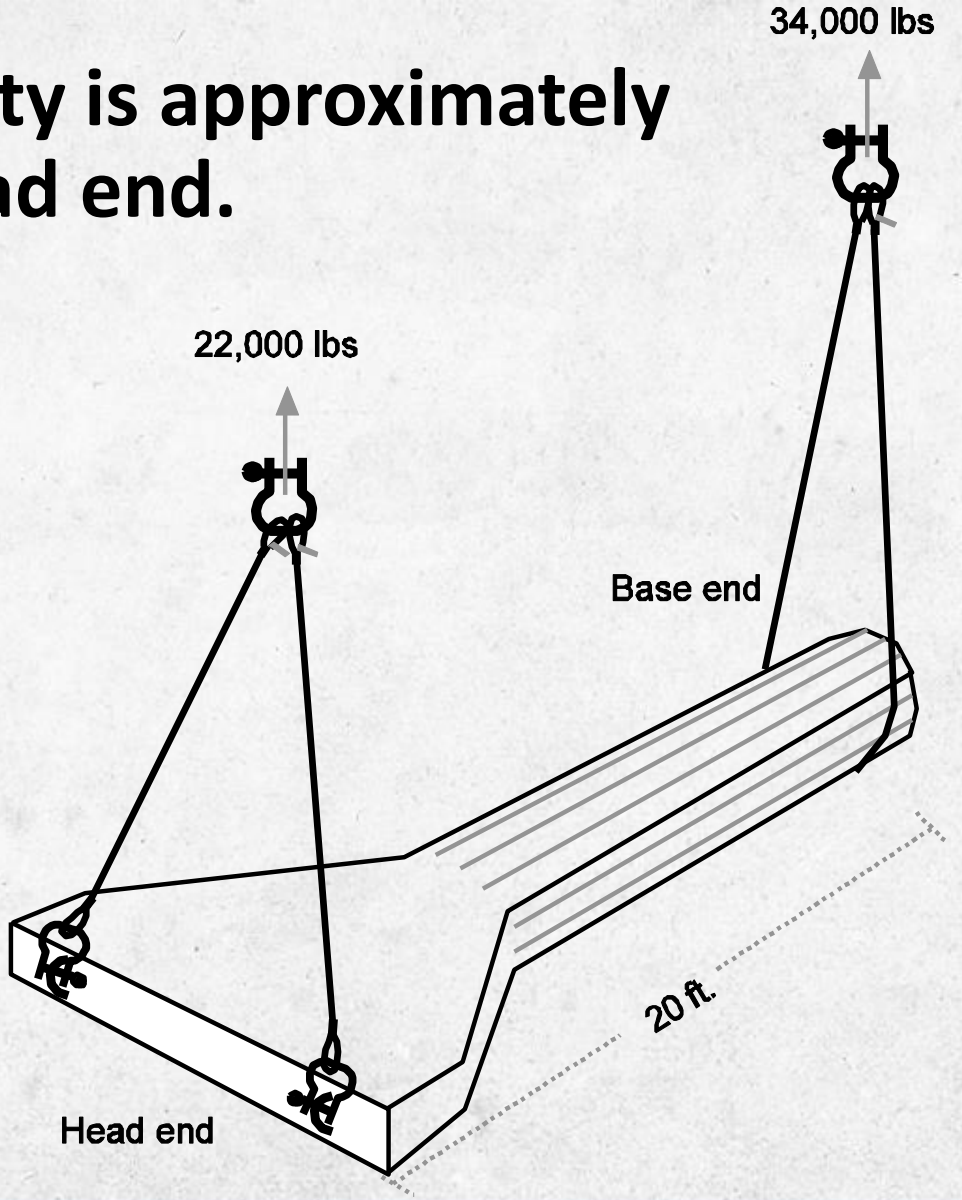
A. Increases
B. Decreases
C. Stays the same
D. Exceeds safety factor

16. As the sling angle gets closer to vertical, the amount of stress on the sling:

A. Increases
B. Decreases
C. Stays the same
D. Exceeds safety factor

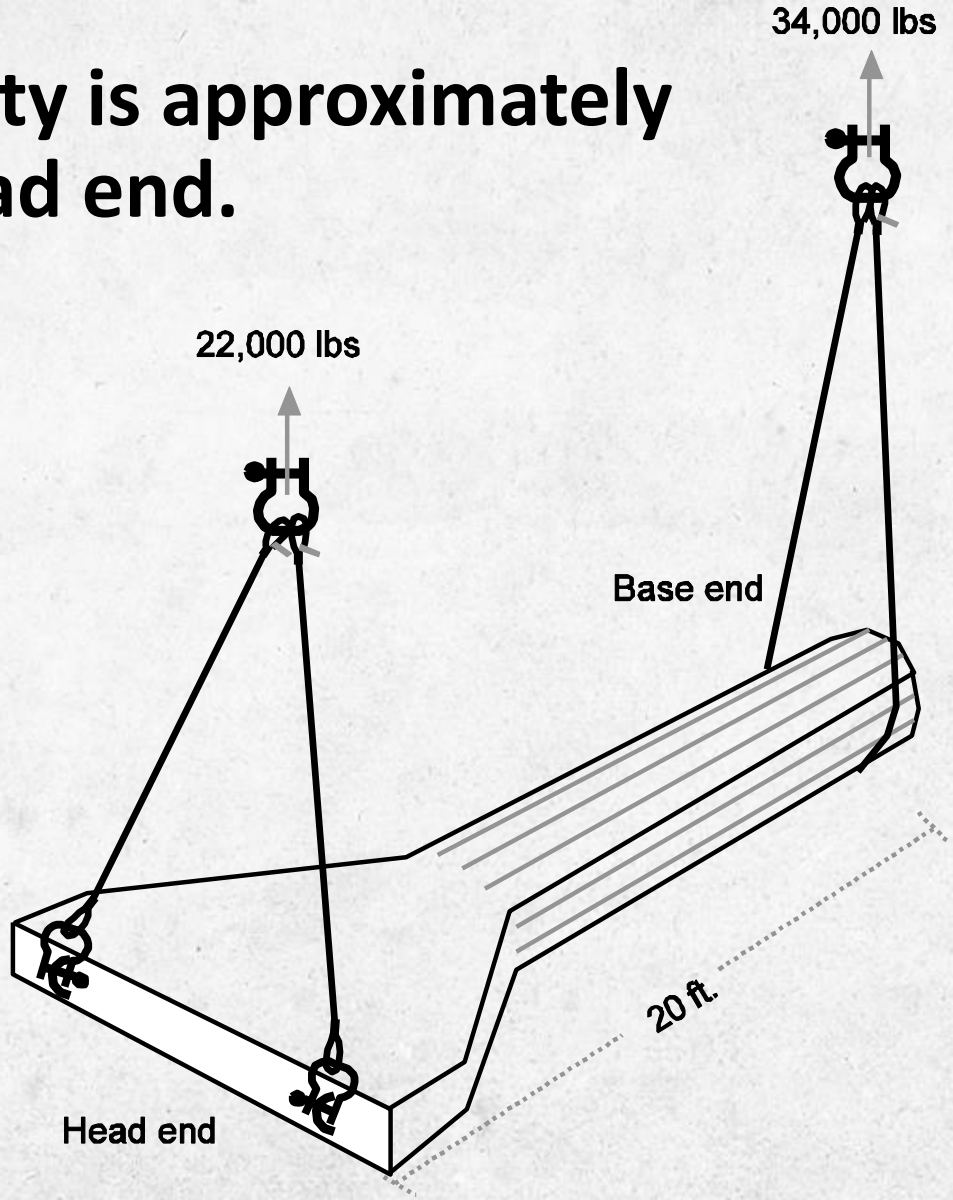
17. The center-of-gravity is approximately _____ from the head end.

A. 6.8´
B. 10.2´
C. 12.2´
D. 14.6´



17. The center-of-gravity is approximately _____ from the head end.

A. 6.8´
B. 10.2´
✓ C. 12.2´
D. 14.6´



18. What type of rigging would be preferred for handling a load in a 300 degree F temperature environment?

A. Nylon slings
B. Wire rope slings
C. Chain slings
D. Both B and C

18. What type of rigging would be preferred for handling a load in a 300 degree F temperature environment?

A. Nylon slings
B. Wire rope slings
C. Chain slings
✓ D. Both B and C

19. Considering a mobile crane, the weight of the suspended load, load block, and rigging is 45,687 lbs., and the load block is reeved in 6 parts of line. What would be the approximate lead line stress on the main hoist line?

A. 3,950 lbs
B. 9,445 lbs
C. 7,615 lbs
D. 6,932 lbs

19. Considering a mobile crane, the weight of the suspended load, load block, and rigging is 45,687 lbs., and the load block is reeved in 6 parts of line. What would be the approximate lead line stress on the main hoist line?

A. 3,950 lbs
B. 9,445 lbs
✓ C. 7,615 lbs
D. 6,932 lbs

20. Given that the weight of reinforced concrete is 150 lbs./cu.-ft., how many cubic feet and what weight will a reinforced concrete block be that measures 5’ x 4’ x 4’?

A. 20 cu.-ft., 3,000 lbs
B. 64 cu.-ft., 9,600 lbs
C. 80 cu.-ft., 1,200 lbs
D. 80 cu.-ft., 12,000 lbs

20. Given that the weight of reinforced concrete is 150 lbs./cu.-ft., how many cubic feet and what weight will a reinforced concrete block be that measures 5’ x 4’ x 4’?

A. 20 cu.-ft., 3,000 lbs
B. 64 cu.-ft., 9,600 lbs
C. 80 cu.-ft., 1,200 lbs
✓ D. 80 cu.-ft., 12,000 lbs

21. The broken wire removal criteria for rejecting a mobile crane's 6 strand hoist rope from service is __ broken wires in a length of lay or __ broken wires in a strand within a length of lay.

A. 2, 4
B. 6, 3
C. 7, 4
D. 12, 4

21. The broken wire removal criteria for rejecting a mobile crane's 6 strand hoist rope from service is __ broken wires in a length of lay or __ broken wires in a strand within a length of lay.

A. 2, 4
B. 6, 3
C. 7, 4
D. 12, 4

22. A below-the-hook lifting device must display at a minimum:

A. Name and address of the manufacturer
B. Serial number and rated load
C. Weight if over 100 pounds
D. All of the above

22. A below-the-hook lifting device must display at a minimum:

A. Name and address of the manufacturer
B. Serial number and rated load
C. Weight if over 100 pounds
✓ D. All of the above

23. Wire rope on an overhead crane shall be secured to the drum with no less than _____ full wraps of rope when the hook is in its extreme low position, and the crane does not have a lower limit device.

A. 10
B. 5
C. 2
D. 8

23. Wire rope on an overhead crane shall be secured to the drum with no less than _____ full wraps of rope when the hook is in its extreme low position, and the crane does not have a lower limit device.

A. 10
B. 5
✓ C. 2
D. 8

24. A _____ hook can be used in a chain sling to adjust a sling's leg length.

A. Locking latch
B. Standard sling
C. Grab
D. Foundry

24. A _____ hook can be used in a chain sling to adjust a sling's leg length.

A. Locking latch
B. Standard sling
✓ C. Grab
D. Foundry

25. Additional counterweight may be added to a mobile crane if _____.

A. It is the only way the lift can be made
B. You are working in the stability area of the load chart
C. Approved by the manufacturer
D. Your supervisor approves

25. Additional counterweight may be added to a mobile crane if _____.

A. It is the only way the lift can be made
B. You are working in the stability area of the load chart
C. Approved by the manufacturer
D. Your supervisor approves

26. Leveling of the load can be achieved using:

A. A bridle hitch
B. Adjusting the tag line
C. Adjusting the softeners
D. A chainfall

26. Leveling of the load can be achieved using:

A. A bridle hitch
B. Adjusting the tag line
C. Adjusting the softeners
✓ D. A chainfall

27. When examining a hook for spreading, the _____ is measured.

A. Mousing length
B. Shank enlongation
C. Section thickness
D. Throat dimension

27. When examining a hook for spreading, the _____ is measured.

A. Mousing length
B. Shank enlongation
C. Section thickness
✓ D. Throat dimension

28. To create load compression and grip WHILE maintaining a high rated capacity, _____ hitches should be used.

A. Single wrap choker
B. Single wrap basket
C. Double wrap choker
D. Double wrap basket

28. To create load compression and grip WHILE maintaining a high rated capacity, _____ hitches should be used.

A. Single wrap choker
B. Single wrap basket
C. Double wrap choker
✓ D. Double wrap basket

29. Mousing of a hook is used to:

A. Secure the rigging to the load
B. Secure the load slings in the hook
C. Secure the hook to the wire rope
D. Secure the wire rope to the lifting device

29. Mousing of a hook is used to:

A. Secure the rigging to the load
B. Secure the load slings in the hook
C. Secure the hook to the wire rope
D. Secure the wire rope to the lifting device

30. The two types of fabricated chain slings are ___ and ___.

A. Welded, hand-formed
B. Mechanical, hand-formed
C. Machined, fused
D. Welded, mechanical

30. The two types of fabricated chain slings are ___ and ___.

A. Welded, hand-formed
B. Mechanical, hand-formed
C. Machined, fused
✓ D. Welded, mechanical

Q&A