

OSC 10
Ohio Safety Congress & Expo

The good, the bad and the ugly of rigging on construction sites
(SCH156)

Wednesday, March 31, 2010 4 to 5 p.m.
Al Abel, Mazzella Lifting Technologies

The World's **MOST COMPLETE** Lifting Center

CRANES
WIRE ROPE
FABRICATION
HARDWARE
SLINGS
FIELD SERVICE

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The Good, The Bad and The Ugly of Rigging on Construction Sites

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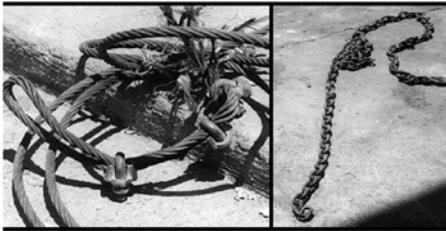
The good . . .




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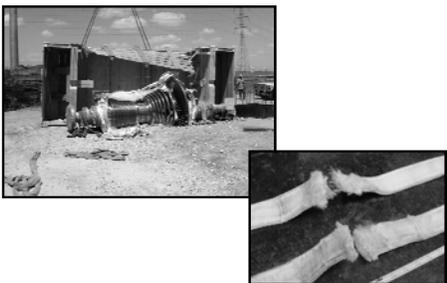
The bad . . .



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The ugly . . .



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The good . . .

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The bad . . .

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The ugly . . .

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The good . . .

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The bad . . .

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The ugly . . .

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It's a Fact . . .

"More people are injured while moving materials than while performing any other function"




What causes headlines like these?

Overhead Sling Causes Injuries
Dropped Load Pins Man
Worker Dies When Load Falls
Worker Severs Finger While Rigging
OSHA Investigating the Accident




Overhead Lifting—
What is it?

What is overhead lifting?



The process of lifting which would elevate a freely suspended load to such a position that dropping the load would present the possibility of bodily injury or property damage.




"Overhead lifting is a special event."

Risk is created every time we lift a load off the ground.




Risk is . . .

- Possibility of loss or injury
- Someone or something that creates or suggests a hazard
- Peril





How Can You Manage Risk?

Risk management is a comprehensive set of actions that reduces the risk of a problem, a failure, an accident.





Risk Management Means . . .

Plan Every Lift



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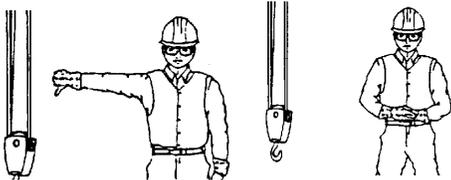
What are the Steps in our lifting plan?

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Who is Responsible (competent) for this Rigging?

Communications established?



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What is a Qualified Person?

“A person who, by possession of a recognized degree or certificate of professional standing in an applicable field, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.”

. . . from ASME B 30.9

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Is the Equipment in Acceptable Condition?

Proper Identification?



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Are the Working Load Limits Adequate?

Capacity of Gear Known?



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Are the Working Load Limits Adequate?

What is the weight of the load?
What is the center of gravity?

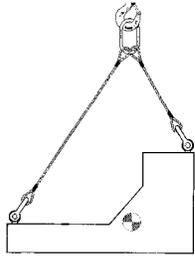


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The Center of Gravity

Center of gravity is directly below the load hook
and
connection to the load is above center of gravity

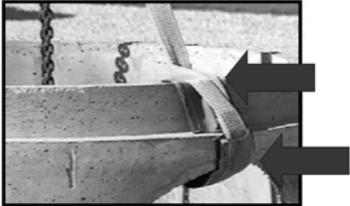


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Are the Working Load Limits Adequate?

Are the slings padded against sharp corners?



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Sling Protection

Synthetic slings **MUST** be protected from corners, protrusions, rough surfaces and in some cases where used with rigging hardware.

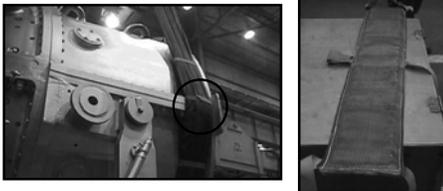


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Sling Protection

All edges on the load, including those that are not the primary load bearing areas, need to be protected.

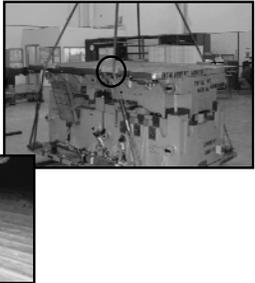


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Sling Protection

Steel slings such as wire rope and alloy chain may need to be protected from their load.



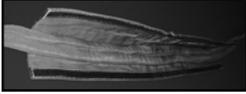
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Sling Protection

Two different types of protection are necessary for synthetic slings and they are mutually exclusive.

First: Abrasion protection.



Second: Cut protection.



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Are the Working Load Limits Adequate?

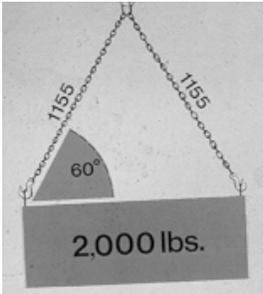
What is the sling angle?



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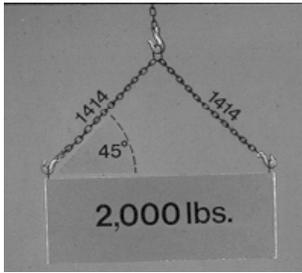
Are the Working Load Limits Adequate?



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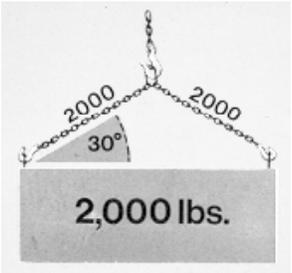
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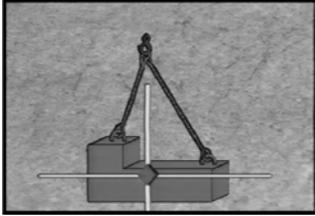


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Are the Working Load Limits Adequate?

Is the load rigged to the center of gravity?



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Will the Load be Under Control?

Is the hitch appropriate?



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Selecting Slings & Hitches for Load Control

- **Select the sling to be used considering:**
 - The hitch to be used
 - The load that will be applied
 - The rigging environment

Choker Hitch



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Single Leg and Load Control

- They provide good control only for simple loads
- Do not use hitch for lifting loose materials, long material, any load that can tip



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Basket Hitch and Load Control

- For more contact with the load use a double wrap basket hitch
- Do not overlap at the bottom of the load



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Choker Hitch and Load Control

- A choker hitch does not provide 360 degree contact with the surface
- A block of wood between hitch and load improves grip and angle of choke

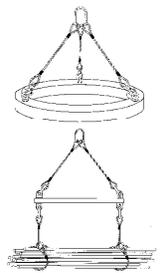


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Load Under Control?

- Slings capture center of gravity?
- Load lift level?
- Load stable?
- Tag line required?



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Will the Load be Under Control?

Is the hitch appropriate?
Tag line needed?



Double choker hitch Double basket hitch

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Are There any Unusual Loading or Environmental Conditions?

Is there any possibility of fouling?
Clear of personnel?



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Will the Load be Under Control?

Wind, temperature, other?



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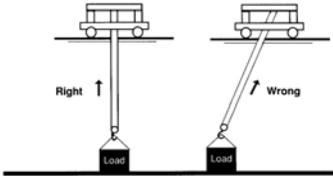
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Cranes are Designed for Vertical Lifts Only

Side pulling and end pulling are improper lifts.



Right ↑ Wrong ↘

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Lifting & Moving of Load

- Pay attention.
- Perform lift so if there is a failure--no one would get hurt.
- Keep hands clear--no pinch points.
- Slowly raise hook block.
- Slowly raise load--to minimize swing.
- Use proper hand signals--when necessary.
- "Respect The Load"

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Rigger's Responsibility

- **The inspection of rigging gear**
 - Frequent Inspection
 - Periodic Inspection
 - Initial Inspection
- **Responsibilities for rigging**
 - Inspection
 - Connection
 - Protection
- **The capacity of rigging gear**
 - Know the working load limit
 - Use within the working load limit
 - Do not modify

Inspection Frequency

- **The inspection of slings and hardware includes:**
- Initial inspection prior to first use
- Frequent inspection by designated person each day the hardware is used
- Periodic, at least annually, inspection accomplished by designated person as part of a thorough inspection program

Inspection Fittings

- **Wear**
- **Legible identification**
- **Deformation**
- **Cracks or sharp nicks**
- **Modification**
- **Wire Rope at termination**
- **Proper function**

Inspection of Wire Rope Slings—Cause for Removal

- Broken wires
- Kinking
- Crushing
- Birdcaging
- Damage to rope structure
- Evidence of heat damage
- Corrosion
- Other damage that would cause doubt
- Missing or illegible sling identification
- Damaged end attachments

EYE →

BODY →

MECHANICAL SPLICE →

ANSI/ASME B30.9

Inspection of Chain Slings—Cause for Removal

- Cracks or breaks
- Excessive wear, nicks or gouges
- Evidence of heat damage
- Excessive pitting or corrosion
- Weld splatter
- Chain or components do not hinge freely
- Stretched, bent, twisted or deformed chain links or components
- Missing or illegible sling identification
- Other damage that would cause doubt

ANSI/ASME B30.9

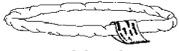
Inspection of Web Slings—Cause for Removal

- Acid or caustic burns
- Melting or charring on part of sling
- Holes, tears, cuts, snags
- Broken or worn stitches
- Excessive abrasive wear
- Knots in any part of sling
- Discoloration, brittle or stiff areas on any part of the sling which may mean chemical or ultraviolet damage
- Missing or illegible sling identification
- Other damage that would cause doubt

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**Polyester Web Slings—
Removal from Service**

- Acid or caustic burns
- Evidence of heat damage or weld splatter
- Broken or damaged core yarns
- Knots in any part of sling
- Discoloration, brittle or stiff areas on any part of the sling which may mean chemical damage
- Holes, tears, cuts, abrasive wear, or snags that expose the core yarns
- Missing or illegible sling identification
- Other damage that would cause doubt



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If you have a plan . . .

**What are the Steps in
our lifting plan?**

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If you do your inspections . . .

- **The inspection of slings and hardware includes:**
 - Initial inspection prior to first use
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If you protect your slings . . .

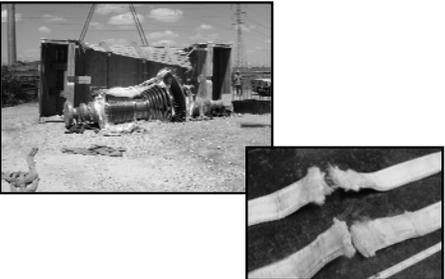
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You will take the ugly . . .



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You will take the bad . . .



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... and make it all good!



"Plan Every Lift"

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Thank You for Attending!

Want more information?

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- Office: 440.239.7000 ext. 212
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- www.mazzellalifting.com

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