

**OSC 12**  
Ohio Safety Congress & Expo

**WELL AT HOME. SAFE AT WORK.**

**354 Rig It Right and You Won't Be Wrong, Part 1**

Al Abel

Wednesday, March 28, 1:15 to 2:15 p.m.

**Ohio** Bureau of Workers' Compensation



A definition

Rigging is . . .

**“Supporting or manipulating an object.”**

**WELL AT HOME SAFE AT WORK OSC 12**

**MAZZELLA**  
Lifting Technologies

“Overhead lifting is a special event.”

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

**WELL AT HOME SAFE AT WORK OSC 12**

**MAZZELLA**  
Lifting Technologies

Risk is . . .

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

**WELL AT HOME SAFE AT WORK OSC 12**

**MAZZELLA**  
Lifting Technologies

It's a Fact . . .

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

**WELL AT HOME SAFE AT WORK OSC 12**

**MAZZELLA**  
Lifting Technologies

A recent article stated . . .

**“Rigging is an art and a profession.”**

**“An improperly rigged load is a death trap waiting for the next unsuspecting victim.”**

**“Training must be given to any person assigned this responsibility.”**

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

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

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

Statements you do not want to hear . . .

- This is better than what we are using
- I have no idea what this weighs
- The company won't buy me what I need
- A bad sling caused the accident
- We have been doing it this way for years

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

How Can You Manage Risk?

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



WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

Risk Management Means . . .

Plan Every Lift



WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

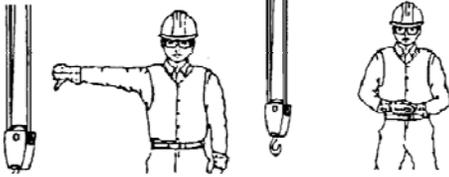
What are the Steps in our lifting plan?

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**Who is Responsible (competent) for this Rigging?**

**Communications established?**



WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

**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

WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

**Is the Equipment in Acceptable Condition?**

**Proper Identification?**



WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

**Are the Working Load Limits Adequate?**

**Capacity of Gear Known?**



WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

**Are the Working Load Limits Adequate?**

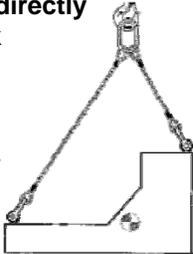
**What is the weight of the load?**  
**What is the center of gravity?**



WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

**The Center of Gravity**

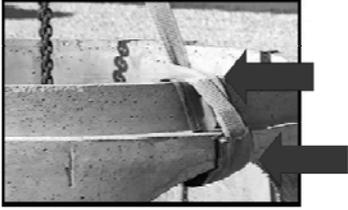
**Center of gravity is directly below the load hook**  
**and**  
**connection to the load is above center of gravity**



WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

**Are the Working Load Limits Adequate?**

**Are the slings padded against sharp corners?**

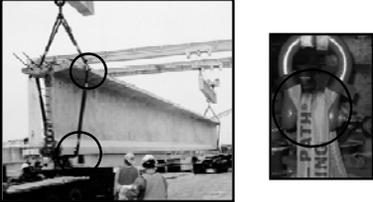


WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**Sling Protection**

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

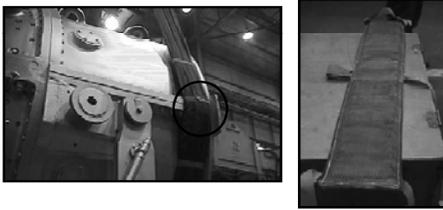


WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**Sling Protection**

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

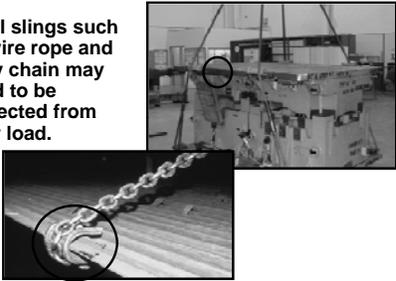


WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**Sling Protection**

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



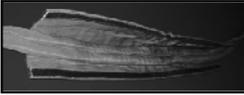
WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

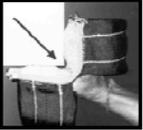
**Sling Protection**

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

First: Abrasion protection.



Second: Cut protection.



WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**Are the Working Load Limits Adequate?**

**What is the sling angle?**



WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

Are the Working Load Limits Adequate?

1155 1155  
Sling Angle 60°  
2000 lbs.

WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

Are the Working Load Limits Adequate?

1414 1414  
Sling Angle 45°  
2000 lbs.

WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

Are the Working Load Limits Adequate?

2000 2000  
Sling Angle 30°  
2000 lbs.

WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

Are the Working Load Limits Adequate?

Is the load rigged to the center of gravity?

WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

Will the Load be Under Control?

Is the hitch appropriate?

Double WRAP hitches

WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

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

WELL AT HOME SAFE AT WORK OSC 12  
MAZZELLA Lifting Technologies

**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

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**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

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**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

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**Load Under Control?**

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

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**Will the Load be Under Control?**

Is the hitch appropriate?  
Tag line needed?

Double choker hitch      Double basket hitch

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

**Are There any Unusual Loading or Environmental Conditions?**

Is there any possibility of fouling?  
Clear of personnel?

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

Will the Load be Under Control?

Wind, temperature, other?



WELL AT HOME SAFE AT WORK OSC 12

MAZZELLA Lifting Technologies

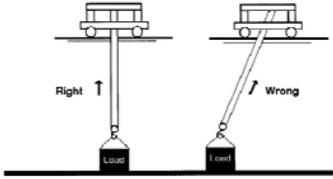
Remember

WELL AT HOME SAFE AT WORK OSC 12

MAZZELLA Lifting Technologies

Cranes are Designed for Vertical Lifts Only

Side pulling and end pulling are improper lifts.



WELL AT HOME SAFE AT WORK OSC 12

MAZZELLA Lifting Technologies

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"

WELL AT HOME SAFE AT WORK OSC 12

MAZZELLA Lifting Technologies

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

WELL AT HOME SAFE AT WORK OSC 12

MAZZELLA Lifting Technologies

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



WELL AT HOME SAFE AT WORK OSC 12

MAZZELLA Lifting Technologies

## Inspection of Hardware

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

ANSI/ASME B30.26

**WELL AT HOME**  
SAFE AT WORK

**OSC 12**  
The Only One You Need

**MAZZELLA**  
Lifting Technologies

## Inspection of Wire Rope Slings—Case 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

ANSI/ASME B30.9

**WELL AT HOME**  
SAFE AT WORK

**OSC 12**  
The Only One You Need

**MAZZELLA**  
Lifting Technologies

## 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

**WELL AT HOME**  
SAFE AT WORK

**OSC 12**  
The Only One You Need

**MAZZELLA**  
Lifting Technologies

## 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

ANSI/ASME B30.9

**WELL AT HOME**  
SAFE AT WORK

**OSC 12**  
The Only One You Need

**MAZZELLA**  
Lifting Technologies

## 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

ANSI/ASME B30.9

**WELL AT HOME**  
SAFE AT WORK

**OSC 12**  
The Only One You Need

**MAZZELLA**  
Lifting Technologies

## If you have a plan . . .

# What are the Steps in our lifting plan?

**WELL AT HOME**  
SAFE AT WORK

**OSC 12**  
The Only One You Need

**MAZZELLA**  
Lifting Technologies

If you do your inspections . . .

**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

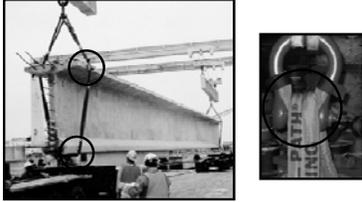


WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

If you protect your slings . . .

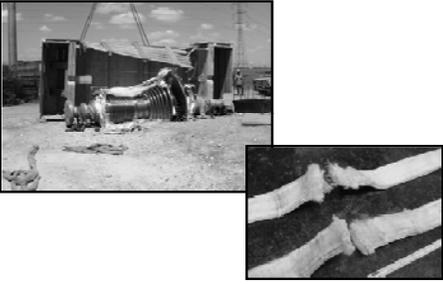
Synthetic slings **MUST** be protected from corners, protrusions, rough surfaces and in some cases where used with rigging hardware.



WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

You will take the wrong . . .



WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

. . . and make it right!

“Plan Every Lift”



WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

[www.mazzellalifting.com](http://www.mazzellalifting.com)



WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies

Thank You for Attending!

Want more information?

- Speaker: [aabel@mazzellalifting.com](mailto:aabel@mazzellalifting.com)
- Office: 440.239.7000 ext. 212
- Cell: 216.410.1765
- [www.mazzellalifting.com](http://www.mazzellalifting.com)

WELL AT HOME SAFE AT WORK OSC 12

**MAZZELLA**  
Lifting Technologies



o Points of view, ideas, products, demonstrations or devices presented or displayed at the Ohio Safety Congress & Expo do not constitute endorsements by BWC. BWC is not liable for any errors or omissions in event materials.

**OSC 12**  
Ohio Safety Congress & Expo