Rice Global E&C Forum
Engineering & Construction

A LIFT PLAN FOR EVERY LIFT

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SEPTEMBER 13, 2019

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TEN QUESTIONS THAT MUST BE ANSWERED BEFORE ATTEMPTING ANY LIFT

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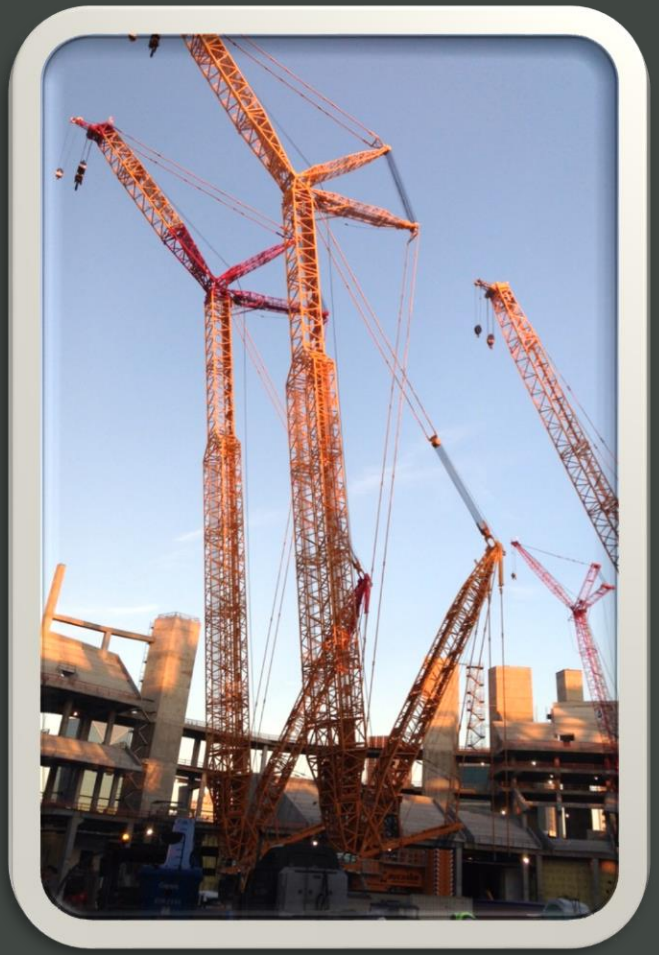
When attempting any lift, regardless of how small or seemingly insignificant, there is some basic information that must be known and confirmed before you begin.



TEN QUESTIONS THAT MUST BE ANSWERED BEFORE ATTEMPTING ANY LIFT

As an industry, we do a great job planning critical and super lifts.

These major lifts are executed with precision and are successful when the plan is carefully followed.

We don't do as well on the everyday routine or standard lifts.

TEN QUESTIONS THAT MUST BE ANSWERED BEFORE ATTEMPTING ANY LIFT

In most cases there is little or no planning and when things go wrong, accidents result.

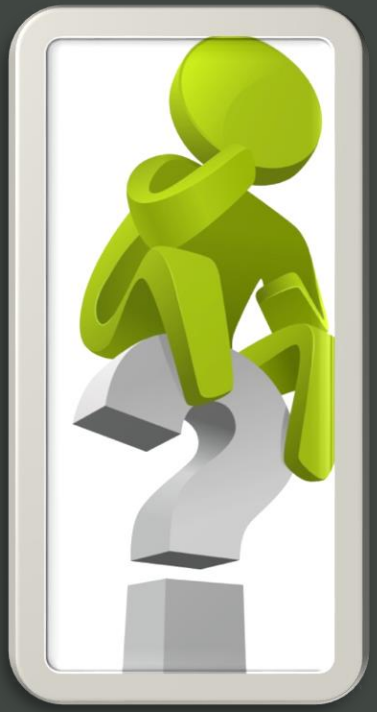
The majority of crane accidents occur with lifts that are classified as standard when in fact there is nothing standard about any lift.

TEN QUESTIONS THAT MUST BE ANSWERED BEFORE ATTEMPTING ANY LIFT

It has been shown that when a lift plan is required for every lift, the supervisors, operators and riggers catch mistakes before they happen.

THE TEN QUESTIONS

1. What is the weight of the load?
2. What is the maximum radius?
3. What is the rigging capacity and weight?
4. What are the capacity chart deductions?
5. What is the crane net capacity?
6. What is the percent of the cranes capacity?
7. Is the crane on firm level ground?
8. Are there power lines in the load path of the crane?
9. Are there obstructions in the load path of thecrane?
10. Will the load contact the crane or boom during the lift?



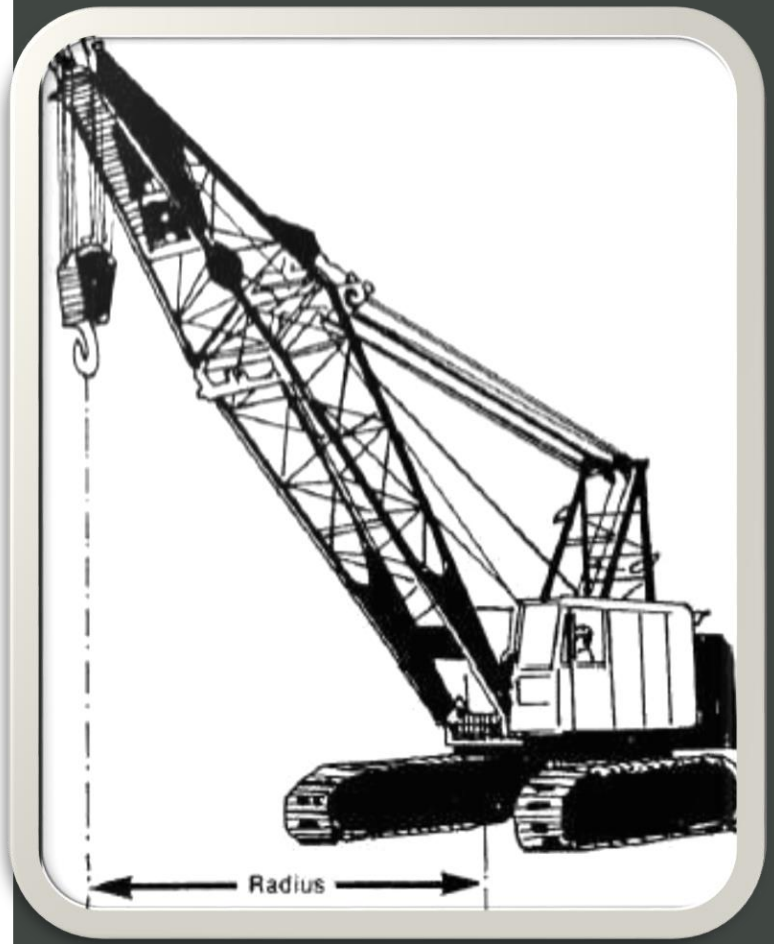
1. WHAT IS THE "VERIFIED" WEIGHT OF THE LOAD?

It is not possible to make a safe lift when the weight of the load is not known or verified.

Many loads can be easily calculated; such as a bucket of concrete or a steel beam. Most loads are shipped to the work site by truck; the trucking company weight ticket is a good source for weight information.

In any case, the load weight is critical and must be known and verified

2. WHAT IS THE MAXIMUM RADIUS?

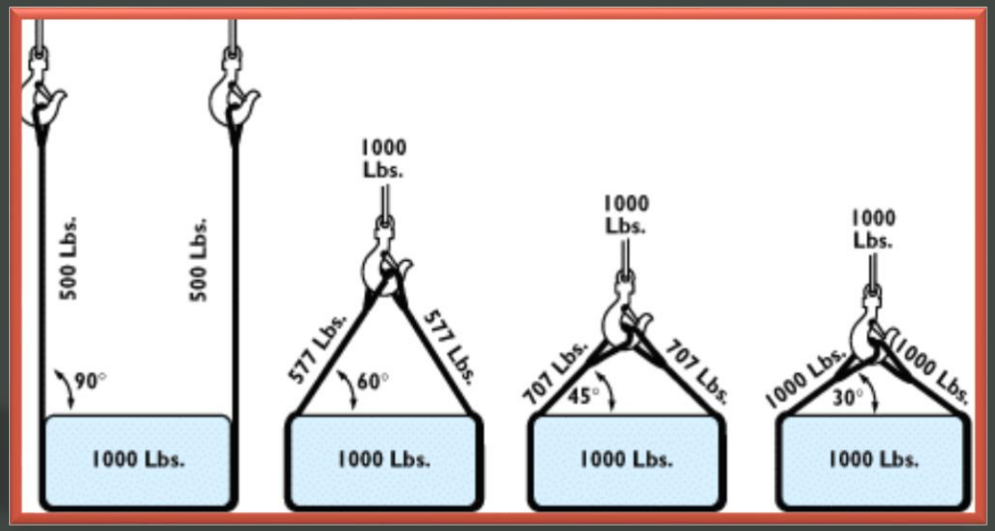


- The radius must be measured
- A dry run can be performed by placing the empty hook over the pick and set locations; measuring radius for each case

Calculate the lift according to the longest radius

3. WHAT IS THE RIGGING CAPACITY AND WEIGHT?

- Calculate the capacity of the rigging assembly
- The system is only as strong as the weakest link
- Consider the effect of sling angles on the rigging



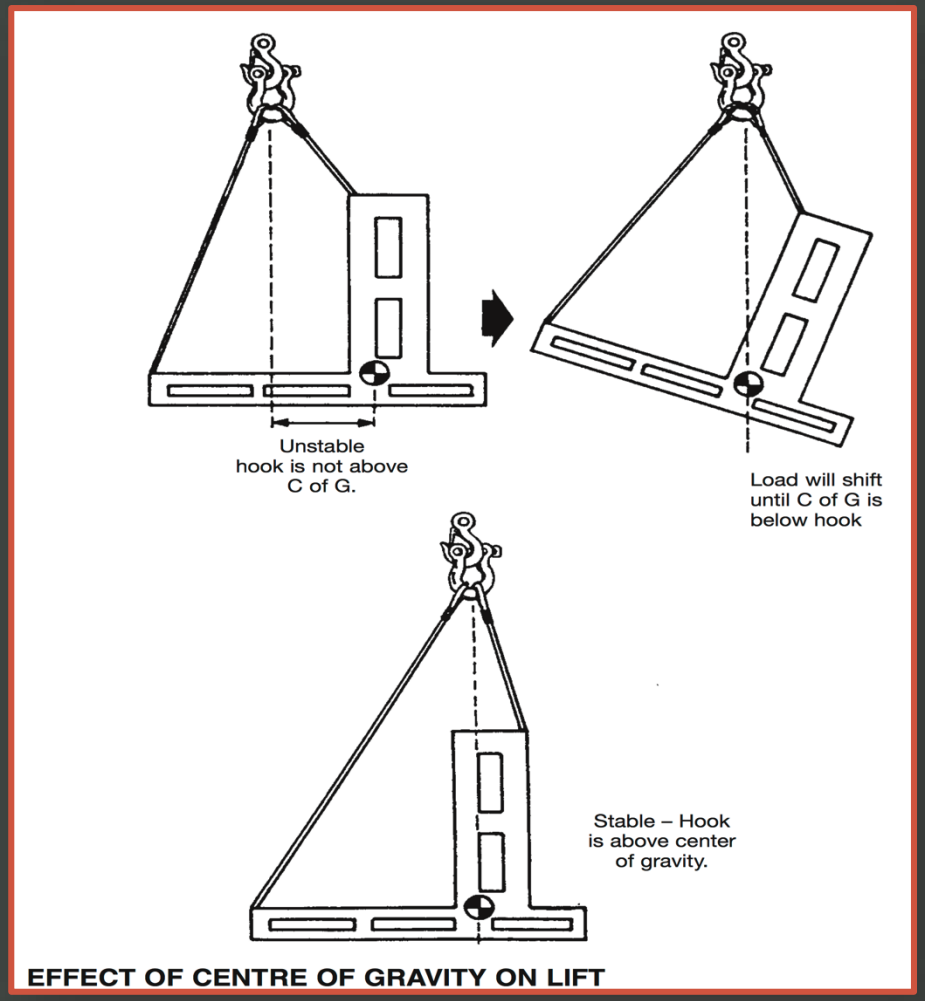
Leg Angle	Load Factor
90°	1.000
85°	1.003
80°	1.015
75°	1.035
70°	1.064
65°	1.103
60°	1.154
55°	1.220
50°	1.305
45°	1.414
40°	1.555
35°	1.743
30°	2.000

3.WHAT IS THE RIGGING CAPACITY AND WEIGHT?

Make sure the load is balanced in the rigging system

Calculate the effective weight of the rigging system and record it on the plan

The weight of the entire rigging system is deducted from the crane chart gross capacity



4. WHAT ARE THE APPLICABLE CAPACITY CHART DEDUCTIONS?

Don't forget to include deductions for attachments that are mounted on the boom and not used; such as jibs or boom extensions.

Everything hanging under the boom top is considered part of the load.

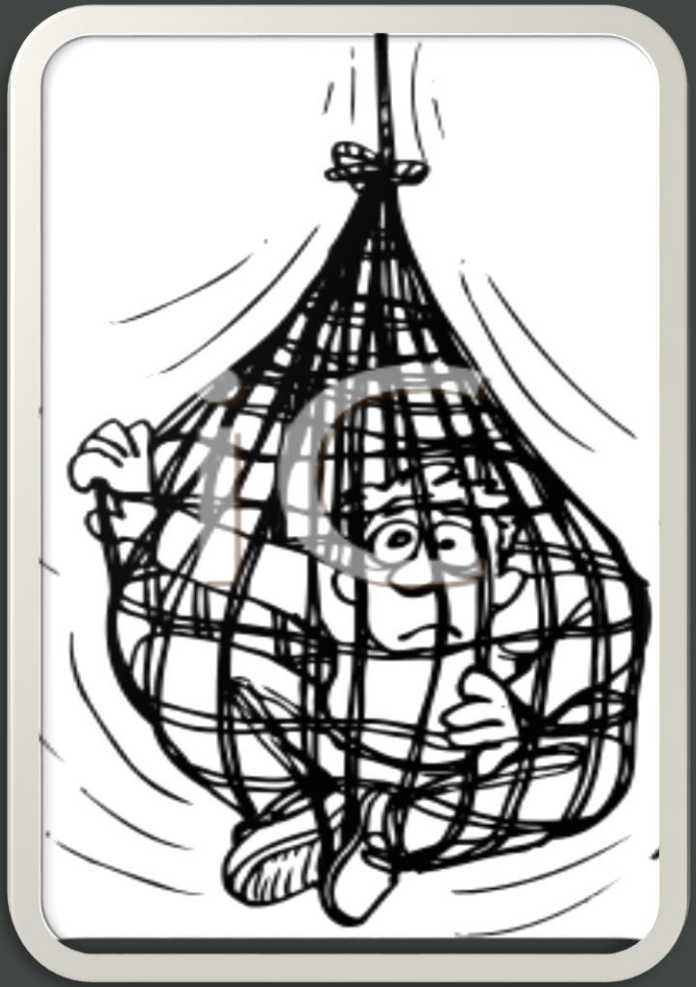
CAPACITY DEDUCTIONS FOR AUXILIARY LOAD HANDLING EQUIPMENT

Load Handling Equipment	Weight (Lbs.)
Auxiliary Head Attached	100
40 Ton Quick Reeve 4 Sheave Hook Block (See Hook Block For Actual Weight)	720
60 Ton Quick Reeve 4 Sheave Hook Block (See Hook Block For Actual Weight)	1100
70 Ton Quick Reeve 5 Sheave Hook Block (See Hook Block For Actual Weight)	1400
8.5 Ton Hook Ball (See Hook Ball For Actual Weight)	360
Lifting From Main Boom With:	
39.5 Ft. Or 67 Ft. Fly Stowed On Base (See Operation Note 4)	0
39.5 Ft. Offset Fly Erected But Not Used	4100
67 Ft. Offset Fly Erected But Not Used	8200
Lifting From 39.5 Ft. Offset Fly With:	
27.5 Ft. Fly Tip Erected But Not Used	PROHIBITED
27.5 Ft. Fly Tip Stowed On 39.5 Ft. Offset Fly	PROHIBITED

5. WHAT IS THE CRANE "NET" CAPACTITY AFTER DEDUCTIONS?

Very often accidents occur because the operator relies solely on the "gross" capacity from the crane chart

All deductible items must be subtracted from the "gross" capacity to establish the "net" capacity



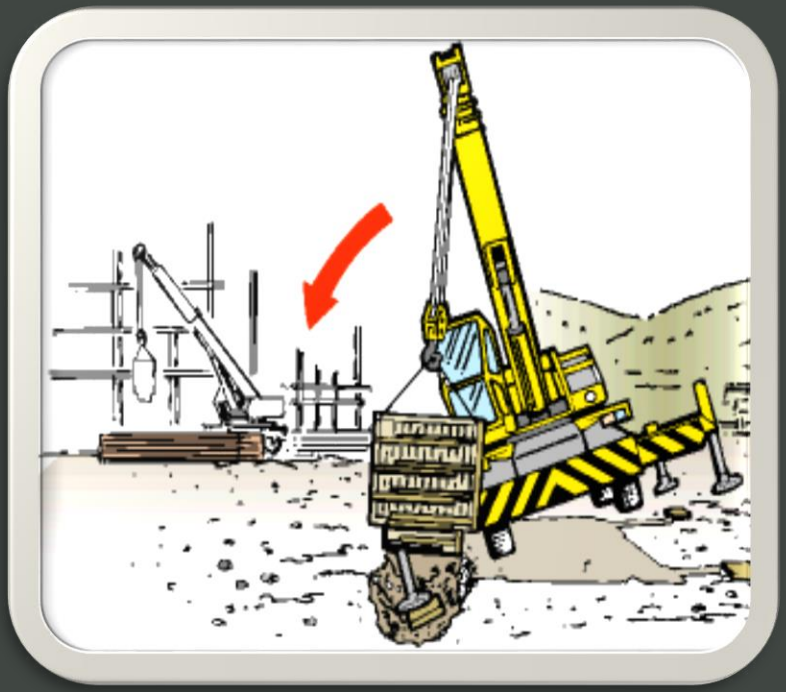
6. WHAT IS THE RATIO OF CRANE CAPACITY TO NET LOAD?

Calculate the percent of load to chart capacity. When a crane is nearing capacity everything has to be exactly right. If anything goes wrong it happens fast and there is little chance to recover.

Require the completion of a more comprehensive "Critical Lift" plan when the "Ten Question" plan indicates the lift has met the criteria for critical lift.

7. IS THE CRANE ON FIRM LEVEL GROUND?

Many crane accidents are a result of loss of stability caused by ground failure.



Be sure to investigate the ground and assure it will support the crane

7. IS THE CRANE ON FIRM LEVEL GROUND?

- Use Proper matting under the outriggers or crawlers.
- Appropriate matting should always be used.
- Beware of recently backfilled excavations.

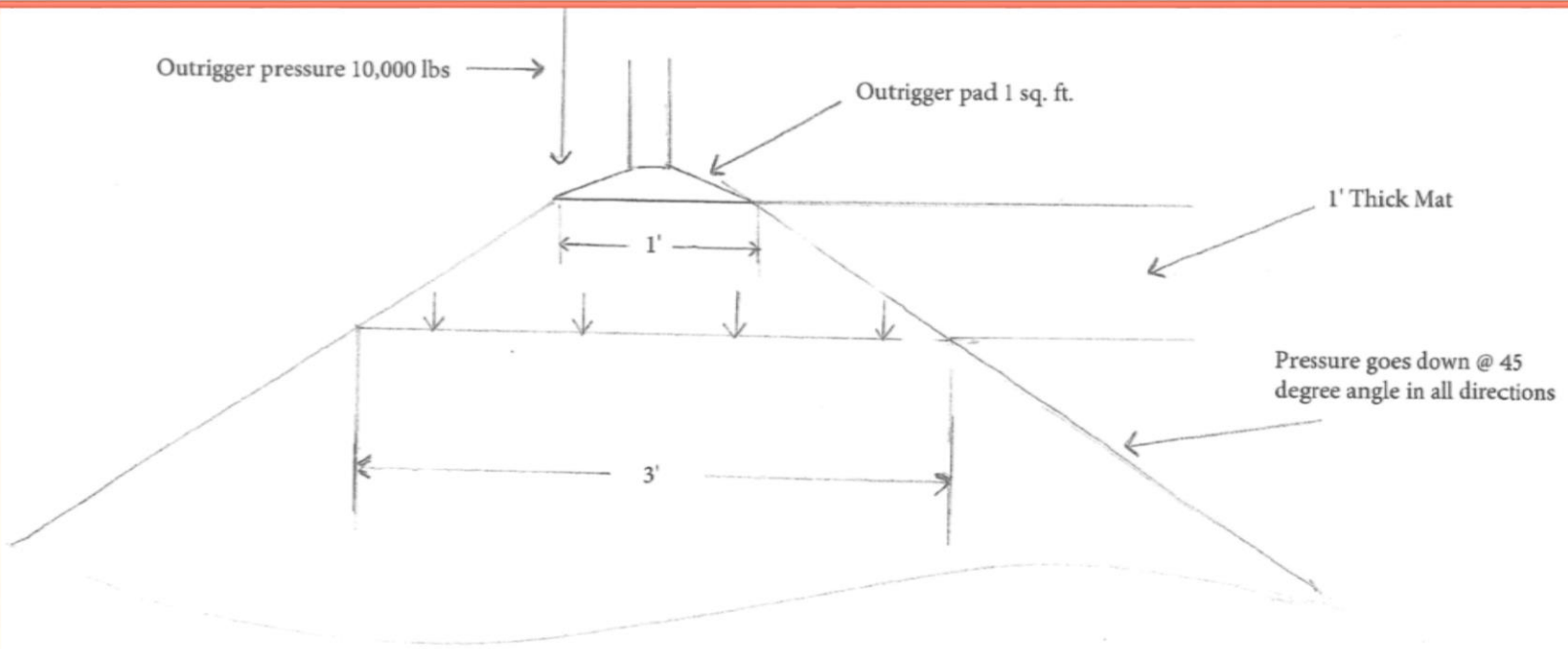
Right

Wrong

7. IS THE CRANE ON FIRM LEVEL GROUND?

7. IS THE CRANE ON FIRM LEVEL GROUND?

7. SIMPLE GROUND PRESSURE CALCULATION

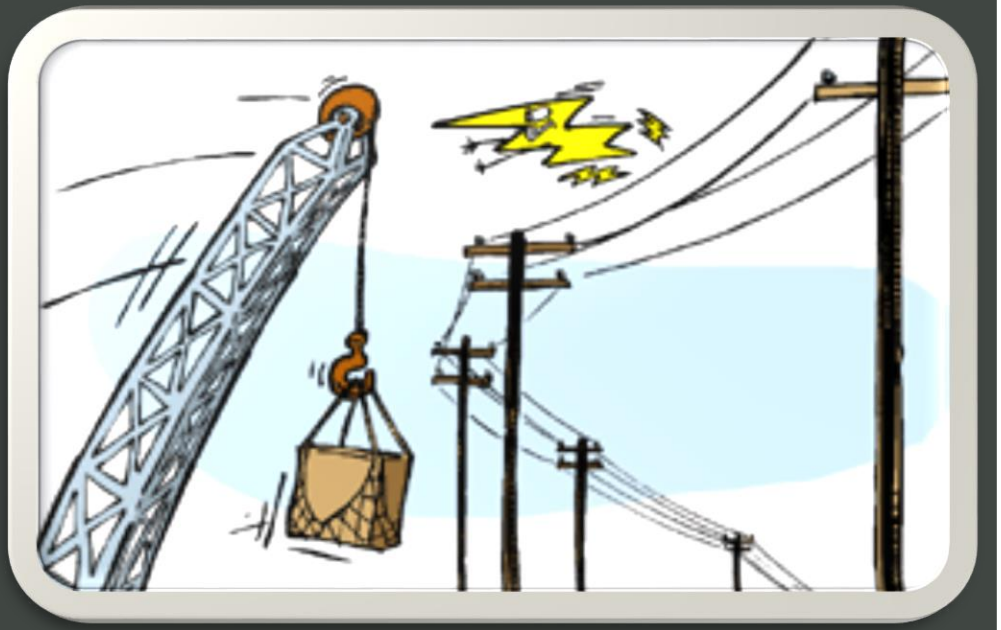


Area under outrigger pad 1 sq ft, ground pressure = 10,000 lbs. psf 10,000/1 = 10,000

Affected area under mat 3 x 3 = 9 sq. ft.
Ground pressure under mat = 1,111 lbs psf 10,000/9 = 1,111

8. ARE THERE POWER LINES ANYWHERE IN THE PATH OF THE LOAD OR CRANE ATTACHMENTS?

See the OSHA Power Line Rule found in the 1926.1400 standard at www.osha.gov for more information.



Note power line locations and record them on the lift plan. Discuss the lift plan with all persons involved so that everyone is aware of the potential hazard.

8. ARE THERE POWER LINES ANYWHERE IN THE PATH OF THE LOAD OR CRANE ATTACHMENTS?

8.NOTICE THE ELECTRICAL ARC AT THE RIGHT REAR WHEEL

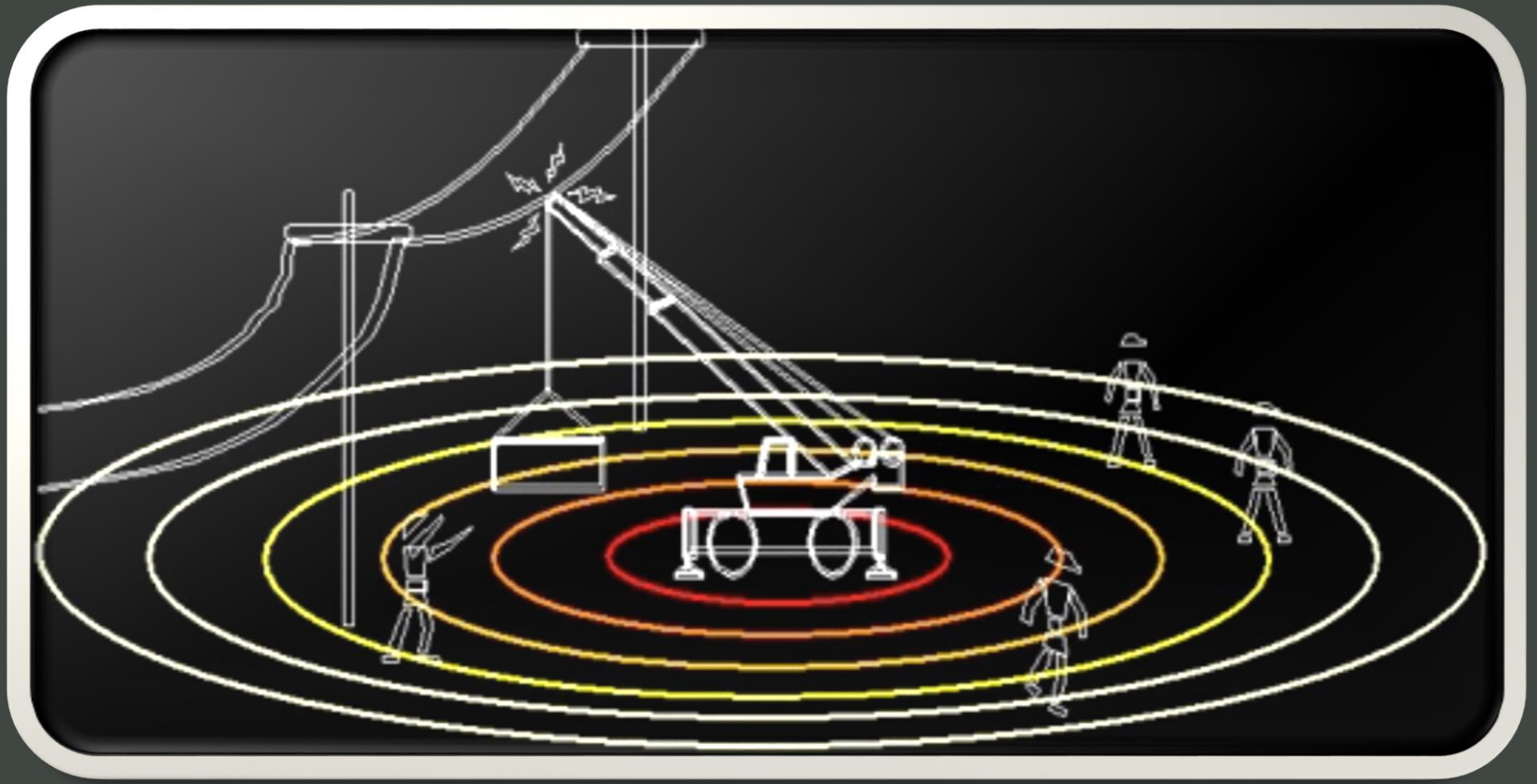
8.THE ENERGY GOING TO GROUND CAUSES THE CONCRETE SLAB TO EXPLODE

8.THE ELECTRICITY IS GOING TO GROUND

8.MASSIVE 46,000 VOLT ARC TO GROUND

8.THE CRANE OPERATOR ESCAPED WITH MINOR INJURIES

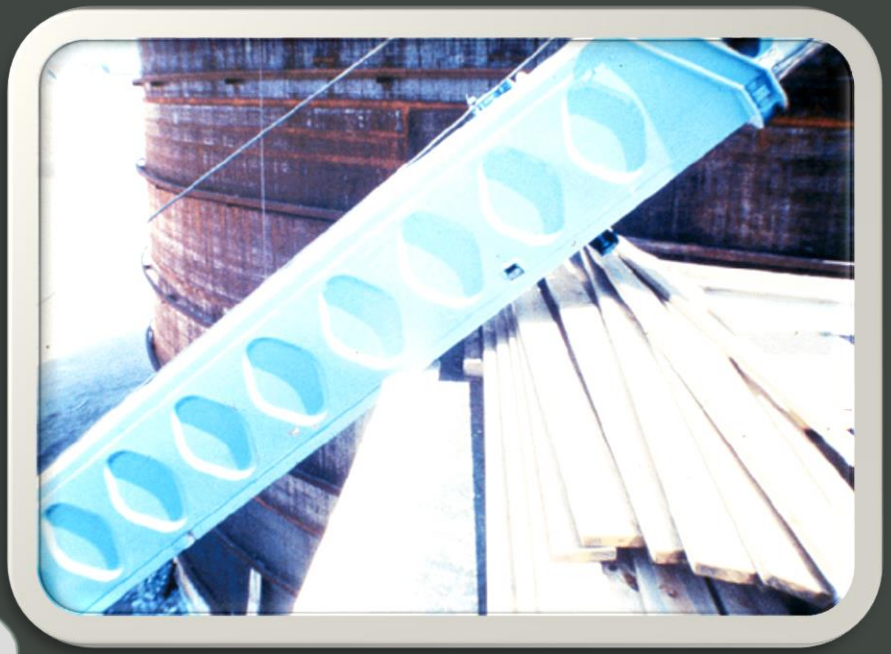
8.THE ESCAPE PLAN IS TO JUMP FROM THE CRANE AND HOP AWAY FROM THE CRANE TO SAFETY



9. ARE THERE OBSTRUCTIONS ANYWHERE IN THE PATH OF THE LOAD OR CRANE ATTACHMENTS?

Make a dry run through the full swing path of the proposed lift and observe clearance to any obstructions.

Don't forget to check behind the crane to see if the counterweights will contact anything.



Survey the work area for obstructions.

10. WILL THE LOAD CONTACT THE CRANE BOOM OR JIB AT ANYTIME DURING THE LIFT?

Always use non-conductive tag lines to control the load.

If a load contacts a loaded boom, the boom could collapse

A LIFT PLAN FOR EVERY LIFT

It should be understood that there are many things that affect the safety of a lift.

The ten-question lift plan is intended to inspire creative thinking and assure the most vital parameters are considered.

It does not, in any way, relieve the crane operator or rigging crew from their responsibilities to consider everything that may affect the safety on any lift.

SAMPLE ROUTINE LIFT PLAN

ROUTINE LIFT PLAN FORM - SAMPLE

Date and Time: _____
Location of the Lift: _____
Crane Make and Model: _____
Crane Serial Number: _____
Load Description _____

Operator Name: _____
Operator Signature: _____
Lift Supervisor Name: _____
Lift Supervisor Signature: _____

1. What is the verified weight of the load?			lbs.
2. The weight is verified by what means? *Shipping document, calculation, certified scale ticket, manufacturer's id tag? Consult the Lift Supervisor when in doubt.*			
3. What is the maximum radius for the lift? *(Measured from the center of rotation of the crane to the center of gravity of the load)*			ft.
4. What is the rigging capacity and combined weight? • *Add everything between the hook and load* • *The rigging is only as strong as the weakest link* • *Reduce the sling capacity for low sling angles*	Capacity		lbs.
	Weight		lbs.
5. What are the applicable crane capacity chart deductions? *Include all rigging and applicable crane attachments.*			lbs.
6. What is the "net" crane capacity after deductions? *(Subtract the total deductions from the gross capacity of the crane chart to find the net capacity)*			lbs.
7. What is the percent of capacity of the crane chart? (Divide the load weight by the crane net capacity) *Over 80% Requires Lift Supervisors Signature* *Over 90% Requires a Critical Lift Plan be completed, approved and signed*			%
8. Is the crane on firm level ground and outrigger mats in place?		YES	NO
9. Are there power lines anywhere in the path of the load or crane attachments? *(Keep all parts of the crane and load 20 feet away from power lines)*		YES	NO
10. Is an electrical proximity permit required, completed, approved and signed?		YES	N/A
11. Are there obstructions anywhere in the path of the load or crane attachments?		YES	NO
12. Can the load contact the boom or jib at anytime during the lift? *Always use tag lines!*		YES	NO
13. Are tag lines of proper length and capacity used?		YES	NO
14. Has a pre-lift meeting been conducted? *All persons involved in the lift must have a clear understanding of what the plan is and what they are supposed to do.*		YES	NO
15. Have all required permits been issued and approved?		YES	NO

Version date: 10/5/2018

CRITICAL LIFTS

A lift is considered to be “critical” if it involves any of the following:

a. Any load greater than 6 tons lifted over or near operating facilities that failure during the lift would impact personnel or cause an uncontrolled release of hazardous material

b. Any load that exceeds 75% of the lifting equipment’s load chart

c. Use of two or more cranes to make any lift.

CRITICAL LIFTS

A lift is considered to be “critical” if it involves any of the following:

d. Assembly of crane boom "in the air" shall be considered a critical lift

e. Lifts encroaching the Minimum Safe Clearance distances to Power Lines

f. Any lift that involves the suspension of personnel above the ground

g. Any other lift due to its nature or equipment being lifted is deemed as a "critical lift" by any involved party

SAMPLE CRITICAL LIFT PLAN

PAGE 1 OF 2

CRITICAL LIFT PLAN FORM - EXAMPLE

Location _____ **Date of Lift** _____
Load Description _____
Lift Description _____

I. General Information

A. WEIGHT (lbs.) — lbs.

1 Weight Equipment _____
2 Weight of Headache Ball _____
3 Weight of Block _____
4 Weight of Lifting Bar _____
5 Weight of Sling & Shackles _____
6 Weight of Jib () Erect () Stored _____
7 Weight of Headache Ball on Jib _____
8 Weight of Cable _____
Allowance for Unaccounted Material in
9 Equipment _____
10 OTHER _____

TOTAL WEIGHT

Source of Load Weight: _____
Weights Verified by: _____

B. JIB

Erected _____ Stored _____
1 Does the job require a Jib _____
2 Length of Jib _____
3 Angle of Jib _____

4 Rated Capacity of Jib from chart _____

C. CRANE PLACEMENT

1 List any Deviation from Smooth Solid Foundation _____
2 List any Underground Line _____
3 List Electrical Hazards in Area _____
4 List Obstacles or obstructions to Lift of Swing _____
5 Swing Direction and Degree (Boom Swing) _____
6 Track, outrigger loading or on rubber _____

D. CABLE

1 Number of Parts of Cable _____
2 Size Cable _____

E. SIZING OF SLINGS

1 Sling Selection
a. Type of Arrangement _____
b. Number of Slings in Hook-up _____
c. Sling Size _____
d. Sling Length _____
e. Rated Capacity of Sling _____
2 Shackle Selection
a. Pin Diameter (Inches) _____
b. Capacity (Tons) _____
c. Shackle Attached to Load by _____
d. Number of Shackles _____

F. CRANE

1 Type of Crane _____
2 Crane Capacity _____
3 Maximum design wind load _____ MPH
4 Lifting Arrangement
Max distance - Center of load
a. to center pin of crane _____
b. Length of boom _____
c. Angle of boom at pick-up _____
d. Angle of boom at set
Rate capacity of crane under severest lifting
e. conditions (from chart)
1 Over Rear _____ lbs.
2 Over Front _____ lbs.
3 Over Side _____ lbs.

From Chart-rated Capacity
4 of Crane for this lift _____ lbs.
5 Max load on crane _____ lbs.
6 Lift is _____% of Crane's Rated Capacity

G. Matting Plan Per CHS Area Ground Bearing Pressure Map

H. PRE-LIFT CHECKLIST — YES / NO

1 Outrigger Matting Acceptable YES / NO
2 Outriggers Fully Extended YES / NO
3 Outriggers Match Load Chart YES / NO
4 Crane in Good Condition YES / NO
5 Swing Room YES / NO
6 Head Room Checked YES / NO
7 Max Counterweights Used YES / NO
8 Counterweights Match Load Chart YES / NO
9 Tag Line Used YES / NO
10 Experienced Operator YES / NO
11 Experienced Flagman (designated) YES / NO
12 Experienced Rigger YES / NO
13 Load Chart in Crane YES / NO
14 Counterweight swing barricaded YES / NO
15 Wind Conditions _____
16 Crane Inspected by _____
17 Functional Test of Crane by _____

SAMPLE CRITICAL LIFT PLAN

PAGE 2 OF 2

CRITICAL LIFT PLAN FORM - EXAMPLE

II. Special Instructions & Diagrams (Prepared by support Engineering)

A. Special instructions or restrictions for crane, rigging, lift, etc.

B. Crane/Load placement, Lifting Point and Rigging Diagram (use separate sheet, if necessary).

C. Contingency plan details

D. Communication system to be utilized

III. Authorization

A. Multiple crane lifts require a separate lift plan for each crane.

B. Any chanes in the configuration of the crane, placement, rigging, liftign scheme, etc., or changes in any calculations will require a new lift plan.

C. Suspended personnel baskets shall be used when there is no safe alternative means of access to the work area such as ladder or erection of scaffolding. A pre-lift meeting with all personnel involved in the lift must be held before the trial lift.

D. Signatures*

_____ Lift Director

_____ Crane Operator

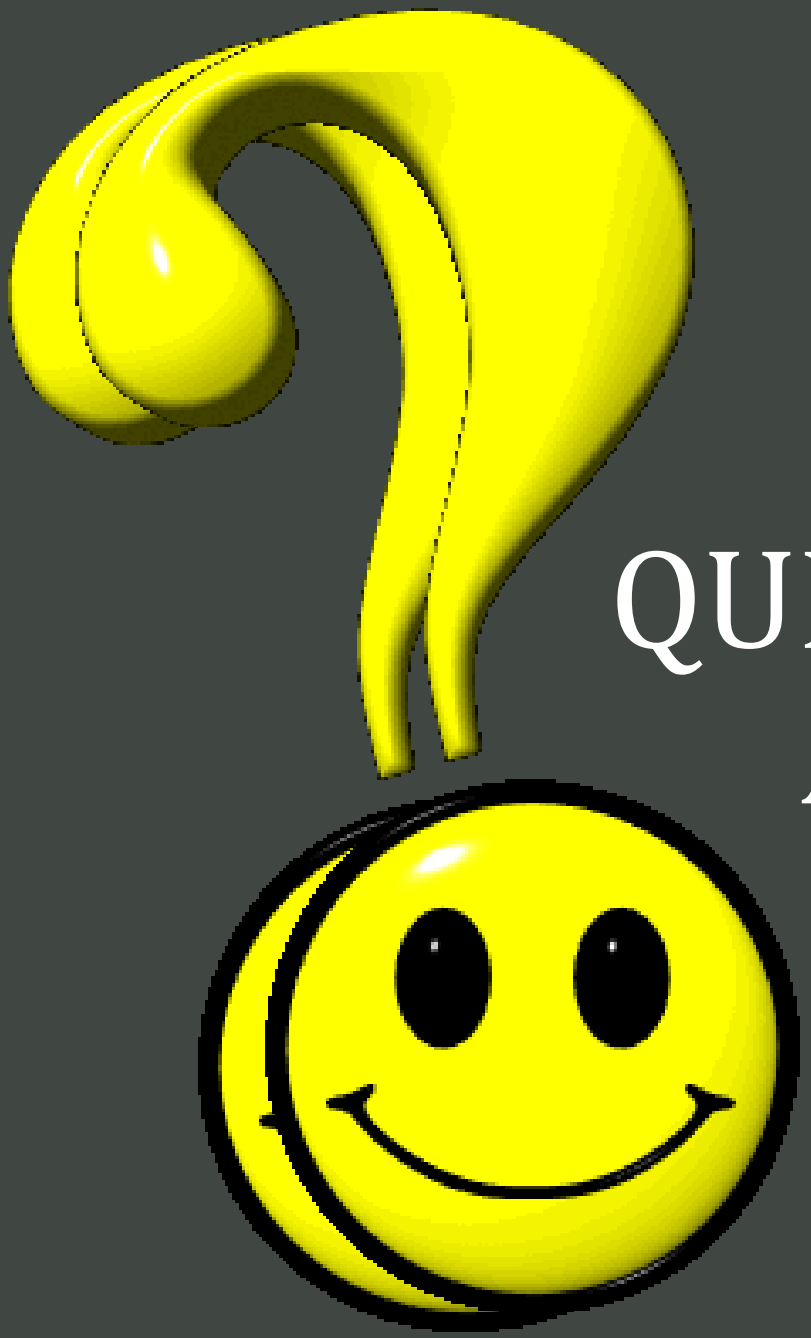
_____ Crew Supervisor

_____ CHS Safety Department Representative

_____ CHS Lift Supervisor (SME)

_____ Work Crew Members (sign on back of form)

* Authorization can be given by a designee when specified approver is unavailable. Authorization is voided if crane is relocated.



QUESTIONS AND ANSWERS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