The Professional Rigger®

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TECHNICAL NEWS

Black Box Lifts

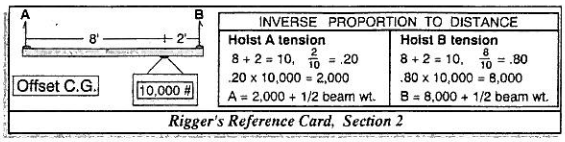
Often a rigger is assigned the task of moving a load and is not given any data on the load's weight or its center of gravity (CG). We might refer to this as lifting a "black box" with many unknowns and a fairly high level of risk involved.

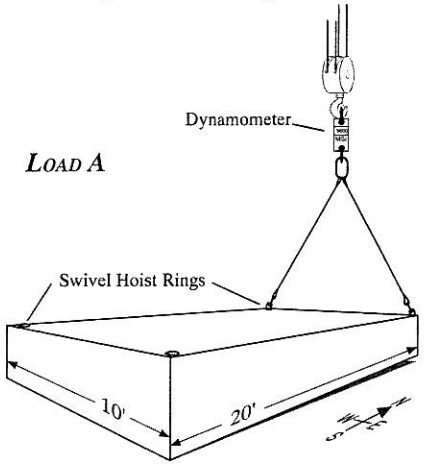
By misjudging or being misinformed about the location of the CG, we may cause the load to lift in a tilted or unstable manner, thereby creating higher-than-expected loading on lift attachments and slings.

A quick way to help solve the question of weight, CG location, and pick point loading is to use a dynamometer or crane scale and perform a series of single-side, trial lifts. By lifting on each end of a given load, we can determine the approx. CG from one end to the other. By lifting each side a few inches, we can also determine the approx. CG location from one side to the other. After these 4 trial lifts, we have discovered the total weight and the load's approx. center of gravity.

As seen in the following illustrations, we are faced with two loads in a dead storage warehouse. It has been years since these loads were put into storage (no records of weight, etc.) and now they must be moved. After a thorough inspection, the swivel hoist rings (rated at 30,000 lbs/ea.) at each corner appear to be in good condition, and the structure appears to be able to withstand 4" high vertical trial lifts.

For the trial lifts, we've selected a 2-leg sling bridle assembly with sufficient capacity to lift 42,000 lbs. at a 60° angle on the longest side.





We lifted each end and side, one at a time, 4" off the floor with the following results:

north end = 9,600 lbs. / south end = 6,400 lbs.
west side = 4,800 lbs. / east side = 11,200 lbs.

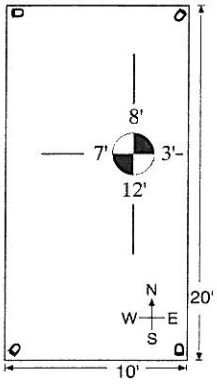
By adding the north and south amounts, we discover the total load weight is approx.16,000lbs. When considering the north/south plane, the load's CG is closer to the north end and we can establish the approx. location as an inverse proportion of weight to horizontal distance (see RRC, Sect 2 above).

9,600/16,000 = .60 [inverse = .40]
.40 x 20' = 8' from north end
6,400/16,000 = .40 [inverse = .60]
.60 x 20' = 12' from south end

Let's figure CG's east/west plane.

4,800/16,000 = .30 [inverse = .70]
.70 x 10' = 7' from west side
11,200/16,000 = .70 [inverse =.30]
.30 x 10' = 3' from east side

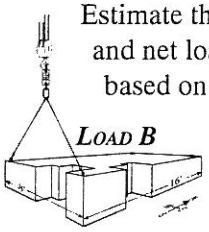
The final step is to determine approx. loading at the pick points.



An easy way to find the loading per swivel hoist ring is to multiply the end load by the side % and we arrive at the corner loading.

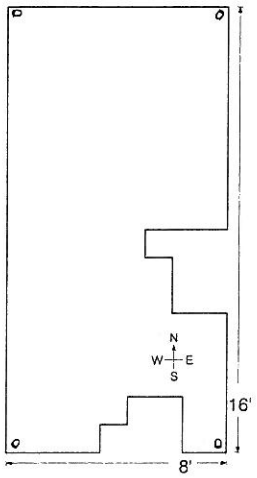
NW corner = 9,600 x .30 = 2,880 lbs.
NE corner = 9,600 x .70 = 6,720 lbs.
SW corner = 6,400 x .30 = 1,920 lbs.
SE corner = 6,400 x .70 = 4,480 lbs.

Now for your workshop assignment!



Estimate the CG's location and net loading per corner based on the following trial lifts for Load B at left.

north end = 19,200 lbs. / south end = 4,800 lbs.
west side = 18,000 lbs. / east side = 6,000 lbs.



CLIENT NEWS

Los Alamos National Laboratory

WRRC was hired to perform an assessment of the sling and rigging hardware inspection procedures being carried out on a daily, monthly and annual basis by the LANL on-site contractor. The Dept. of Energy facility outside Albuquerque, NM received high marks in almost all categories with only a few items that needed to be reviewed and improvements sought.

Westinghouse Hanford Co.

Written exams and hands-on evaluations helped round out the Master Rigger course conducted for the professional riggers at the DOE facility in eastern Washington. WHC's Dana Morgan & Mike Riggs requested that WRRC provide a select group of equipment from its Mobile Learning Center for use with the mobile and bridge crane load stations which included WRRC's Drifting & Winching Structure, Air Jacking and Caster System, Rigging Towers and numerous dynamometers.

Metro - Seattle

A two-day rigging course will be conducted for employees based at the Metro Waste Water Treatment Plant of Seattle, WA. Special attention will focus on rigging techniques with chain falls and block & tackle systems currently being used by Metro field crews.

The Professional Rigger is a quarterly publication of Wire Rope & Rigging Consultants, Inc. It is distributed to those whose occupations require the safe and effective use of lifting and rigging equipment. For more information contact: Editor, The Professional Rigger, PO Box 728, Vancouver, WA 98666 (206) 256-5730.

WRRC NEWS

Crane & Lift Inspections, Inc.

Mike Parnell and Eric Paivio formed Crane & Lift Inspections, Inc. (CLI) to perform inspections of material and personnel hoisting equipment. CLI is Federally Accredited by USDOL/OSHA under 29 CFR Part 1919. Whether our clients need CLI to inspect maritime, general industry, construction, oilfield, mining or nuclear based equipment, the CLI team stands ready to respond.

CLI can perform field hardness tests and metallurgical assessments. Our computerized database helps track wear and damage on cranes and lift equipment, plus the contracting client receives a first-rate documentation package for the machinery inspected.

Put CLI on your Bidder's List for inspection services and let us have a chance to show you how we maintain the professional level of work expected by a member of the Parnell Services Group.

Parnell Services Group

As of January 1, 1994 a collection of companies now operate under the banner of Parnell Services Group (PSG). Our clients know us as the following:

Wire Rope & Rigging Consultants, Inc. (WRRC)

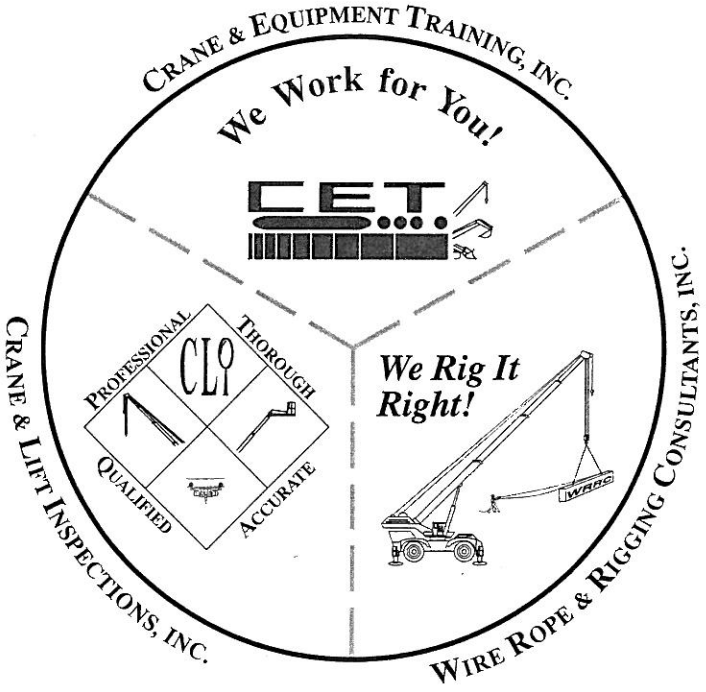
Crane & Equipment Training, Inc. (CET)

Crane & Lift Inspections, Inc. (CLI)

In a nutshell, WRRC provides rigging training, CET provides crane and heavy equipment operator and inspector training, and CLI provides inspection services.

Often clients need a combination of all three organizations' talents. Our clients are assured of the same high level of attention to detail as they have been familiar with when hiring WRRC and CET. The Parnell family continues to offer their money-back guarantee and promises to use whatever resources necessary to meet the needs of our growing client base.

PARNELL SERVICES GROUP



WRRC NEWS (CONT)

Rigging Conference 1994
Las Vegas, here we come!!

With the huge success of Rigging Conference 1993 behind us, we are excited about RC'94, which, you guessed it, will be held in **Las Vegas.** (Please see enclosed flyer.) Conference attendees participate in workshops addressing rigging applications, rigging gear inspection, load weight estimation, wire rope applications, rigging and crane accident case studies, master rigger session, train-the-trainer roundtable, and crane load charts.

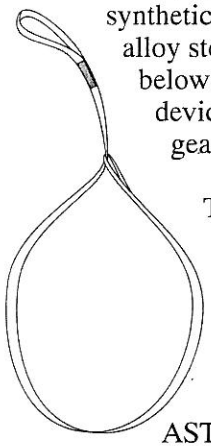
WRRC's Mobile Learning Center is used during the Hands-On Workshop, which includes mobile and gantry cranes, crane and rigging simulators, drifting structure, rigging towers, jacking and rolling, and new material-handling devices.

The final conference event is the Rigging Rodeo, with everyone participating. The events include team competition in moving loads (load control), rigging gear inspections, hand-signals, crane load charts, accident investigation, rigging lift plans and knot tying & splicing. **Call today to register, as seating is limited to the first 160 paid participants.**

WRRC's Certified Inspector Program

Don't miss out on our next Rigging Gear Inspector's Course. A special program will be instructed by WRRC and sponsored by Mazzella Wire Rope & Sling Co. in Cleveland, OH on May 17-19, '94. The regular Fall program is also scheduled for Sept. 13-15 1994 in Vancouver, WA. (Please see the enclosed CIP Flyer for more information.) Call WRRC today to register and reserve your place!

This course addresses inspection of wire rope, wire rope slings, synthetic web slings, alloy steel chain slings, below-the-hook lifting devices, and rigging gear/testing.



The instructional format is based on OSHA CFR 29 1910, ASME B 30 series, ASTM A-391, and ASTM E-4. Participants are required to pass written tests and hands-on field inspections to complete any section.

Black Box Workshop

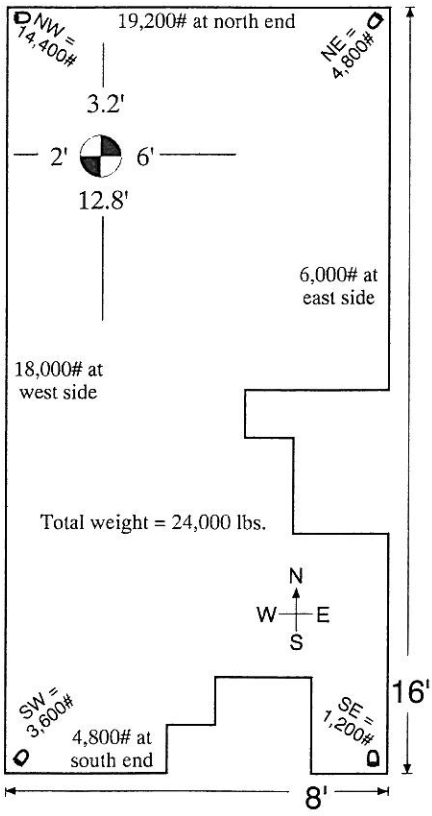
[from pg. 1]

CG from north end and south end.

19,2000/24,000 = .80 [inverse =.20]
.20 x 16' = 3.2' from north end
4,800/24,000 = .20 [inverse = .80]
.80 x 16' = 12.8' from south end

CG from west side and east side.

18,000/24,000 = .75 [inverse = .25]
.25 x 8' = 2' from west side
6,000/24,000 = .25[inverse = .75]
.75 x 8' = 6' from east side



Net load to swivel hoist rings.

NW corner =
19,200 x .75 = 14,400 lbs.
NE corner =
19,200 x .25 = 4,800 lbs.
SW corner =
4,800 x .75 = 3,600 lbs.
SE corner =
4,800 x .25 = 1,200 lbs.

Rigging Conference 1994

Las Vegas

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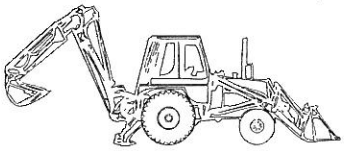
Boise Cascade

CET conducted a 5-day mobile crane course for operators at BC's West Tacoma, WA mill. The delivery of a new National 900 Series B (46,000 lbs. max) initiated the need for a program.

Pacific Gas Transmission

A backhoe and dozer program was conducted for PGT operators at the Pasco, WA facility.



The course focused on upgrading the operators' skill level and the quality of pre-operational inspection practices.

TDC Hoffman/New Mexico

Fork lift and boom truck operator courses were the hot items on the docket at the Rio Rancho INTEL site in January. CET provides training and qualification of some heavy equipment and crane operators at the construction site.

Naval Undersea Warfare Center

Two weeks were required to train and qualify pedestal crane operators based at the Keyport, WA facility. Daily inspections, load chart interpretation, and hands-on operations highlighted the training courses. A special emphasis was placed on operating in "at sea" conditions as pertain to pitch, roll, and listing.

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- Jib Cranes
- Winching Systems

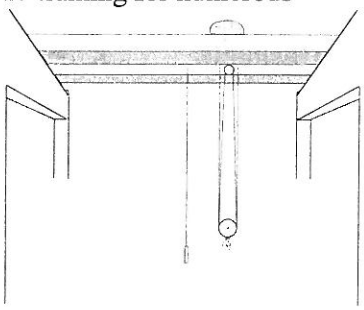
CLI Opens New Office

Crane & Lift Inspections, Inc. began operations this year as a member of Parnell Services Group (other PSG companies include WRRC & CET). The Vancouver, WA based company provides a host of inspection services for material and personnel hoisting equipment.

Mr. Eric Paivio serves as CLI's Technical Services Director and brings 23 years of crane and heavy equipment related experience to CLI. Mr. Paivio is a Federally Accredited Maritime Crane Inspector and, as a result, CLI is accredited under 29 CFR Part 1919 and is processing inspection certification for California and Washington.

On the "Slope"

CLI's affiliate company in Anchorage, AK, Alaska Crane & Lift Inspections, Inc. (ACLI) is busy performing inspections and training for numerous



clients around the Prudhoe Bay area. ARCO Alaska, BP Exploration and Marathon Oil are but a few of the many companies using ACLI's services, with some contracts extending into the mid-to-late 1990's.