

A LAWYER'S GUIDE TO CRANES:

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# CRANE IDENTIFICATION

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

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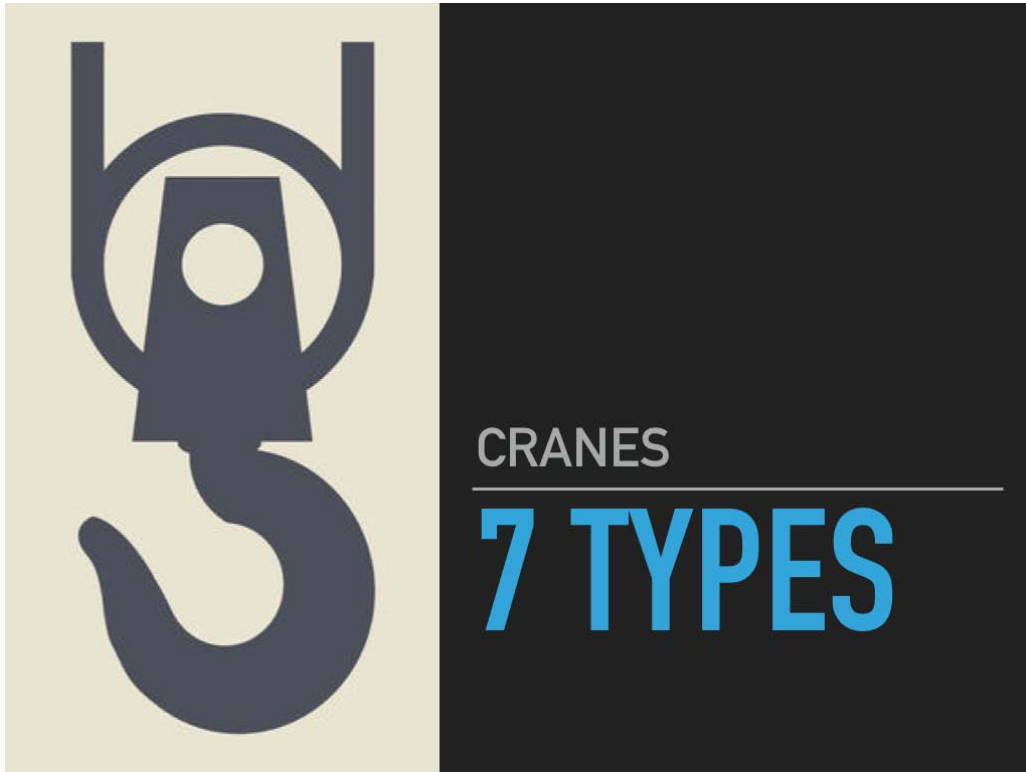
## CRANE IS A GENERIC TERM

- ▶ There are many types of cranes, each having different governing bodies and different OSHA requirements.
- ▶ It is imperative to correctly identify the precise crane type in order to determine the proper industry standards for their safe operation

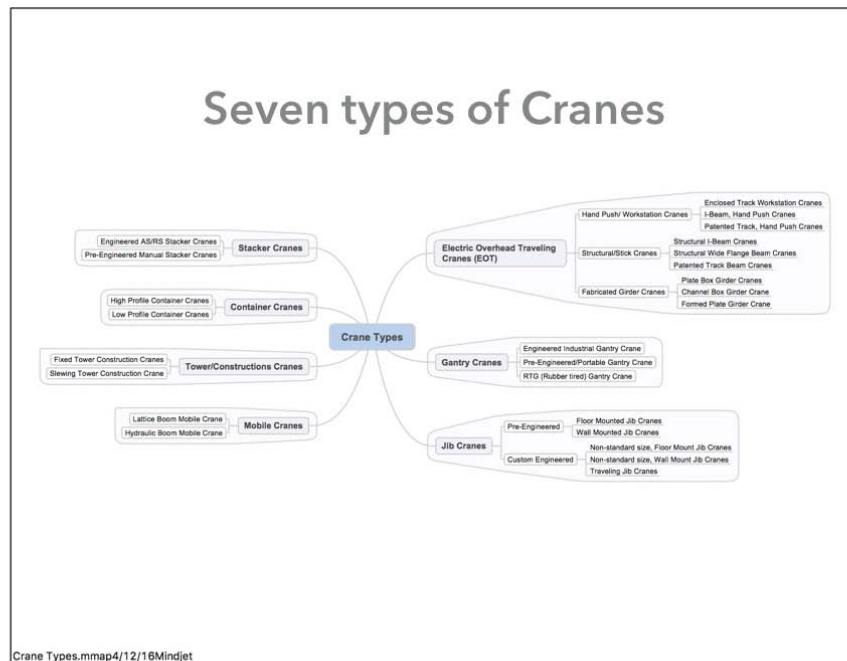
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The term “Crane” is a generic term, with such a broad meaning it becomes meaningless. It’s imperative for those involved to specifically define the type of crane to determine the appropriate ANSI/ASME specifications and the correct OSHA regulations.

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There are seven families of cranes. The three on the right hand side of the mind map are similar while the four on the left have almost nothing in common.

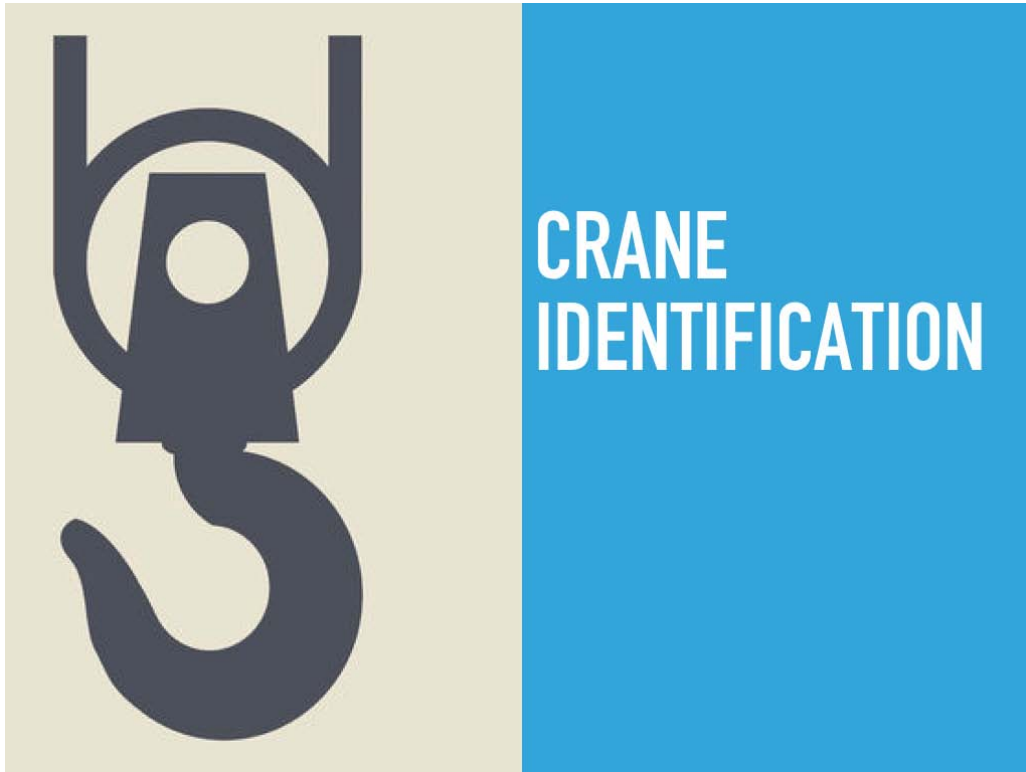
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## HOW DIFFERENT CAN THEY REALLY BE?

- ▶ Different industry
- ▶ Different industry associations
- ▶ Different operator training requirements
- ▶ Different OSHA/ANSI/ASME regs
- ▶ Different vocabulary and nomenclature
- ▶ ... they're just DIFFERENT!!!

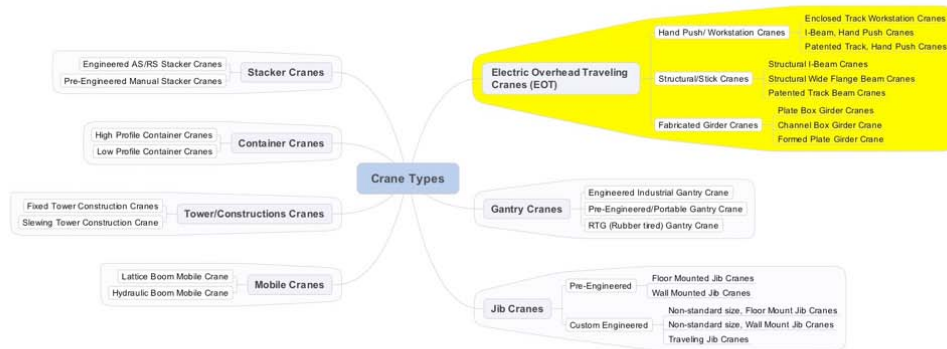
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## GROUP 1: ELECTRIC OVERHEAD TRAVELING CRANES



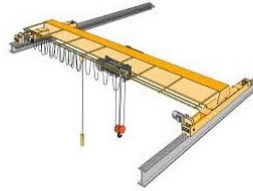
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Let's start with the EOT Cranes and their three sub-groups.

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## OVERHEAD CRANES

- ▶ Nomenclature (synonyms)
  - ▶ Overhead crane
  - ▶ Bridge crane
  - ▶ Overhead bridge crane
  - ▶ Electric Overhead Traveling Cranes (EOT)



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Before we start, it's critical to understand that the four above terms and synonyms for the exact same piece of equipment. The overhead crane is the yellow girder assembly in the picture.

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## OVERHEAD CRANES

- ▶ Nomenclature
  - ▶ Hoists



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The hoist is the piece of machinery that does the lifting. The crane and trolley does the horizontal traversing, and the hoist does the lifting.

The hoist is used on a number of crane types including gantry cranes, jib cranes, overhead cranes and others. There are only about a dozen US hoist builders, but literally

hundreds of crane builders. Most hoist companies have a network of crane builders as dealers. Very few hoist builders sell direct to the end user.

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## OVERHEAD CRANES

- ▶ Three primary families of overhead cranes;
  - ▶ Handpush/Work Station Cranes
  - ▶ Structural/Stick Cranes
  - ▶ Fabricated Girder Cranes

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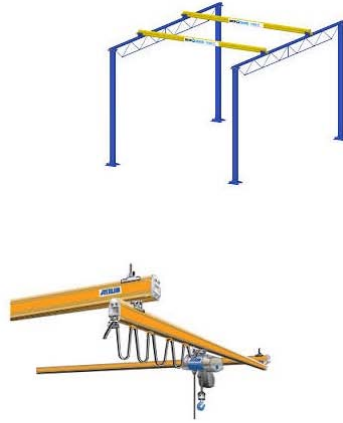
## OVERHEAD CRANES

- ▶ Handpush/Workstation Crane characteristics
  - ▶ Typically, no operator training required
  - ▶ Low cost, pre-engineered product, usually under \$10k
  - ▶ Usually under 3 ton capacity
  - ▶ Hundred of vendors, frequently "home made"

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Dollar wise, this is the low end of the overhead crane spectrum.

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This is the middle range of overhead cranes and by far, the highest volume, most common type of overhead cranes.

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## OVERHEAD CRANES

- ▶ Structural/Stick Cranes characteristics
  - ▶ Operator training dependent on company safety policy
  - ▶ Pre-engineered product, usually \$10k to \$50k
  - ▶ Single and double girder configuration
  - ▶ Usually 5 to 30 ton capacity
  - ▶ Dozens of vendors

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Most crane builders occupy this segment of the overhead crane market. At this level, most crane building a “bolt together” process. The crane builder buys the major components and assembles the components into a working crane.

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## OVERHEAD CRANES

- ▶ Fabricated Girder Crane characteristics
  - ▶ Operator training dependent on company safety policy
  - ▶ Engineered product, usually \$50k to \$250k
  - ▶ Single and double girder configuration, usually double
  - ▶ Usually 30 to 500 ton capacity
  - ▶ A couple dozen vendors

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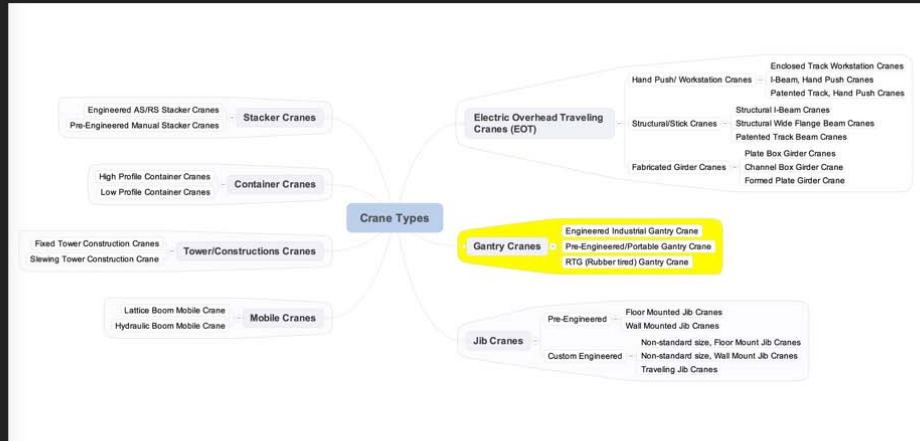
The segment is much smaller in units, but large in dollar volume. There are far fewer crane builders in this segment of the market. The crane builder actually manufactures the crane girders from plate steel and often fabricates their own end trucks and controls. Note, the hoist is almost always still a “buyout.”



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## GROUP 2: GANTRY CRANES



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## GANTRY CRANES

- ▶ Types
  - ▶ Engineered Industrial Gantry Cranes
    - ▶ Single Leg
    - ▶ Double Leg
  - ▶ Pre-Engineered/Portable Gantry Cranes
  - ▶ RTG (rubber tired) Gantry Cranes

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Gantry cranes are functionally similar to overhead cranes with vertical legs.

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## GANTRY CRANES

- ▶ Engineered Gantry Cranes
  - ▶ Operator training dependent on company safety policy
  - ▶ Custom engineered product, usually over \$50k
  - ▶ Single leg and double leg configuration
  - ▶ Motorized in all directions

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## GANTRY CRANES

- ▶ Pre-engineered/Portable Gantry Cranes
  - ▶ Typically no operator training required
  - ▶ Pre-engineered, catalog product
  - ▶ Only double leg configuration
  - ▶ Usually hand push, but sometimes motorized in all directions

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Pre-engineered/portable gantry cranes are manufactured by a handful of producers and usually sold through a network of resellers.

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## GANTRY CRANES

- ▶ RTG (Rubber Tired) Gantry Cranes
  - ▶ Operator training dependent on company safety policy
  - ▶ Custom engineered product, usually over \$100k
  - ▶ Double leg configuration only
  - ▶ Motorized in all directions and steerable
  - ▶ Usually outdoor service, commonly used in multimodal shipping facilities

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RTG Gantry Cranes are manufactured by a small handful of producers and normally sold direct to endusers. They typically are six to seven figure sales.

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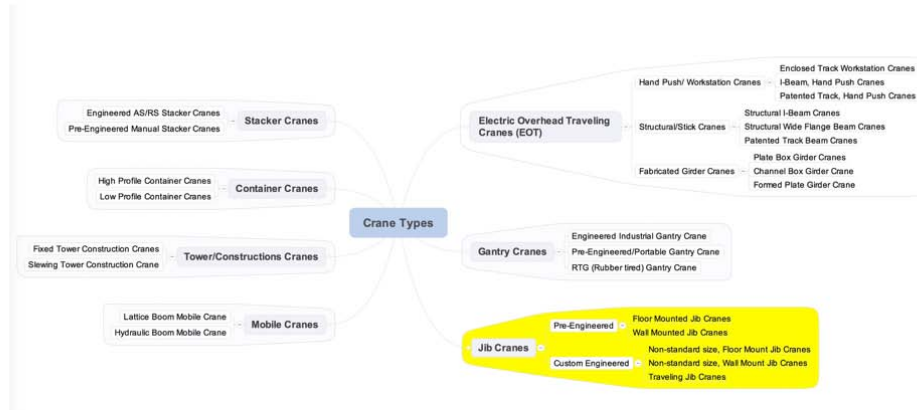
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## GROUP 3: JIB CRANES



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## JIB CRANES

- ▶ Pre-Engineered
  - ▶ Floor mounted Jib Cranes
  - ▶ Wall Mounded Jib Cranes
- ▶ Custom Engineered
  - ▶ Special Sized Floor/Wall Mounted Jib Cranes
  - ▶ Wall Traveling Jib Crane

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## JIB CRANES

- ▶ Wall Mount Jib Crane
  - ▶ Typically, no operator training required
  - ▶ Low cost, pre-engineered product, usually under \$10k
  - ▶ Usually under 5 ton capacity
  - ▶ A couple dozen manufacturers

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Jib cranes are manufactured by a handful of producers and usually sold through a network of resellers. The catalog “standard” products typically go up to 5 ton and some manufacturers also offer custom larger size jib cranes. They are normally “hand operated” lateral motion, but are occasionally powered. They can use hand operated hoists, electric



hoists or air powered hoists.

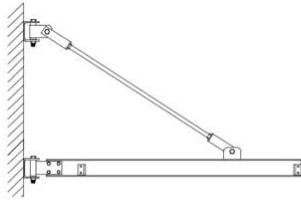
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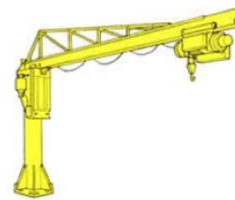
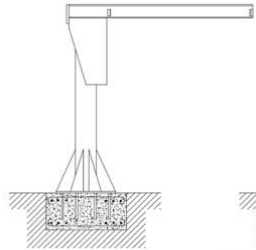
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## JIB CRANES

- ▶ Floor Mount Jib Crane
  - ▶ Typically, no operator training required
  - ▶ Low cost, pre-engineered product, usually under \$10k
  - ▶ Usually under 5 ton capacity
  - ▶ A couple dozen manufacturers

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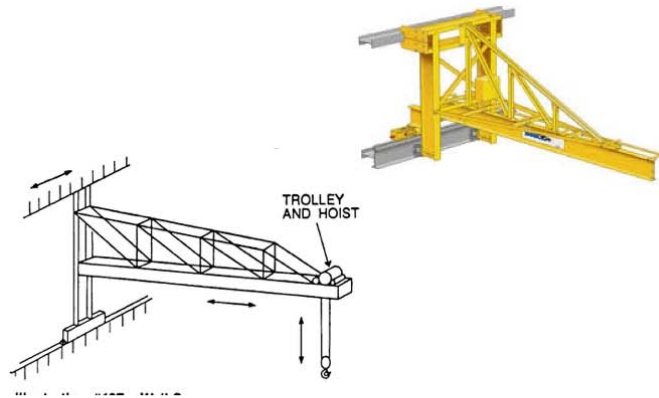
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## JIB CRANES

- ▶ Traveling Wall Mounted Jib Crane
  - ▶ Typically, no operator training required
  - ▶ Custom engineered product, usually over \$50k
  - ▶ Usually under 5 ton capacity
  - ▶ Very few manufacturers and a very rare product

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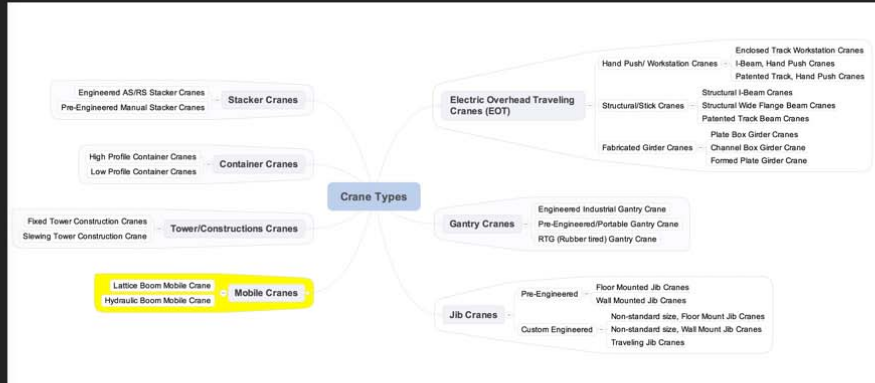
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## GROUP 4: MOBILE CRANES



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## MOBILE CRANES

- ▶ Types
  - ▶ Lattice Boom
  - ▶ Hydraulic Boom

Mobile cranes are lifting devices that are portable via rubber tires or caterpillar tracks.

There are a near infinite configurations of mobile cranes, but most can be divided into two major groups,

- 1) Lattice Boom type and
- 2) Hydraulic Boom type.

## MOBILE CRANES

- ▶ Lattice Boom Mobile Cranes
  - ▶ Certified Operator Training, OSHA mandated
  - ▶ Standardized product
  - ▶ Crane boom is assembled and erected at the job site
  - ▶ Available in both rubber tire and crawler track configurations

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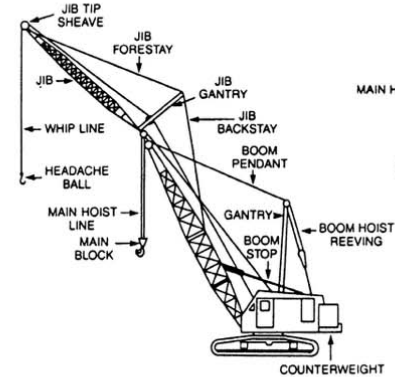
## MOBILE CRANES

- ▶ Hydraulic Boom Mobile Cranes
  - ▶ Certified Operator Training, OSHA mandated
  - ▶ Standardized product
  - ▶ Crane boom requires no assembly in the field, but lower block rigging may be field modified.
  - ▶ Available in both rubber tire and crawler track configurations

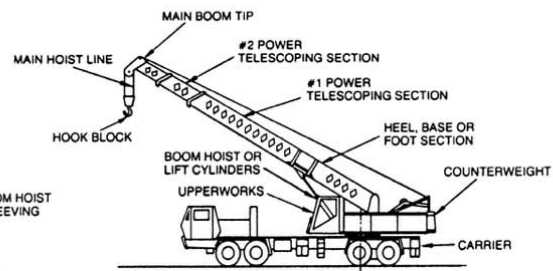
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**Crawler-mounted Lattice Boom Crane**



**Carrier-mounted Hydraulic Telescoping Boom Crane**



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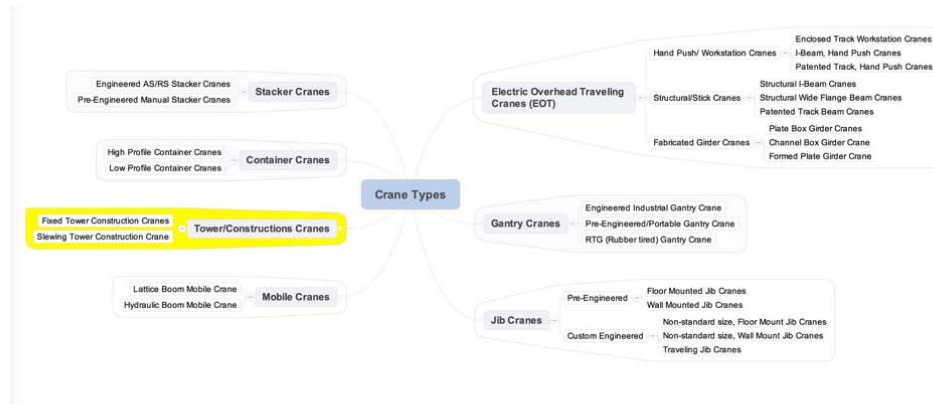
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## GROUP 6: TOWER/CONSTRUCTION CRANES



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## TOWER/CONSTRUCTION CRANES

- ▶ Types
  - ▶ Fixed Tower Construction Cranes
  - ▶ Slewing Tower Constructions Cranes
- ▶ Certified Operator Training, OSHA mandated
- ▶ Standardized product

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Tower Cranes or sometimes call Construction Cranes are the type of crane seen on building construction sites. These cranes are beyond the scope of the author and are mentioned for illustrative purpose only.

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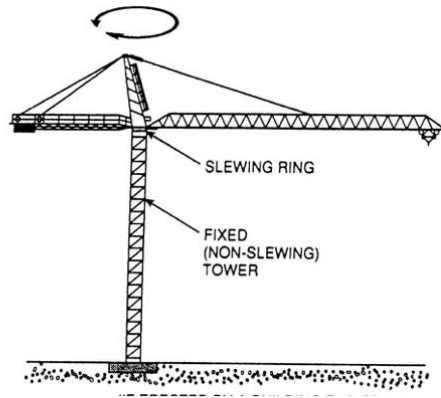
## TOWER/CONSTRUCTION CRANES

- ▶ Fixed Tower, Construction Cranes  
The base is non-moving, but a rotating or slewing ring is located beneath the jib
- ▶ Slewing Tower, Construction Cranes  
The slewing ring is located at the base and the entire assembly rotates.

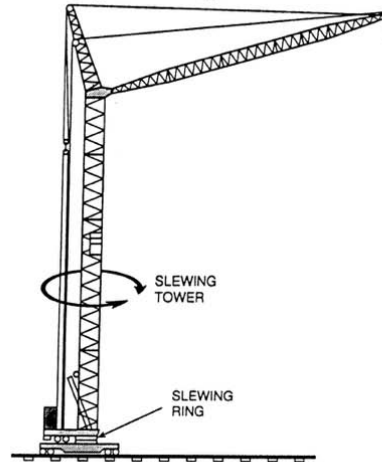
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### Fixed Tower Type



### Slewing Tower Type



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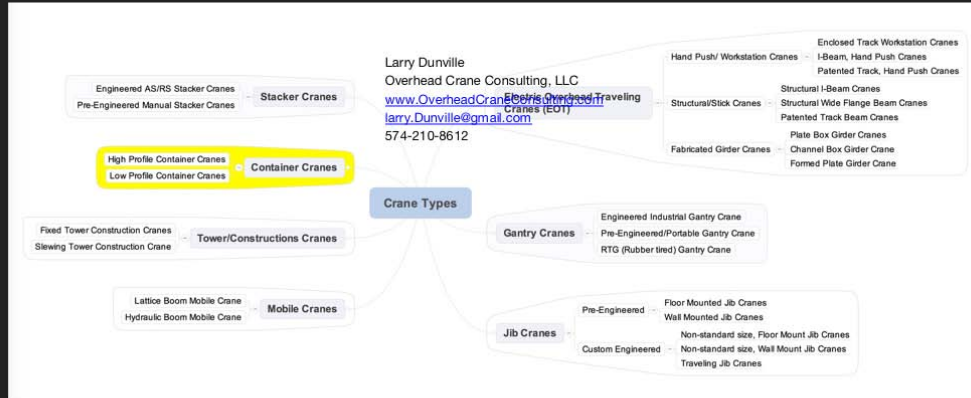
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## GROUP 6: CONTAINER CRANES



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## CONTAINER CRANES

- ▶ Nomenclature (synonyms)
  - ▶ Container Crane
  - ▶ Container Handling Gantry Crane
  - ▶ Ship-to-Shore Crane
- ▶ Types
  - ▶ High Profile Container Cranes
  - ▶ Low Profile Container Cranes

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Container Cranes are the type of crane seen on dockside harbor sites. These cranes are beyond the scope of the author and are mentioned for illustrative purpose only.

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## CONTAINER CRANES

- ▶ High Profile Container Cranes  
high profile, where the boom is hinged at the waterside of the crane structure and lifted in the air to clear the ships for navigation
- ▶ Low Profile Container Cranes  
low profile, where the boom is shuttled toward and over the ship to allow the trolley to load and discharge containers. Low-profile cranes are used where they may be in the flight path of aircraft, such as where a container terminal is located close to an airport.

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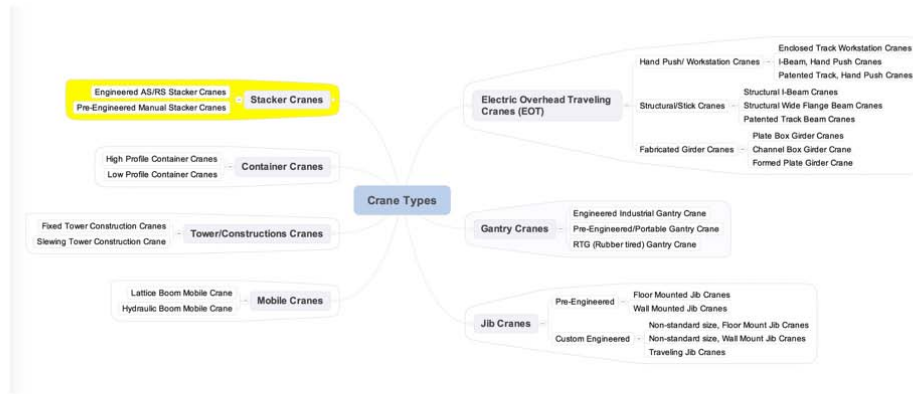
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## GROUP 7: STACKER CRANES



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Lastly Stacker Cranes are more accurately termed Storage and Retrieval Systems. These cranes are beyond the scope of the author and are mentioned for illustrative purpose only.

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## STACKER CRANES

- ▶ Types
  - ▶ Engineered AS/RS Stacker Cranes
  - ▶ Pre-Engineered Manual Stacker Cranes
- ▶ Typically, no operator training required

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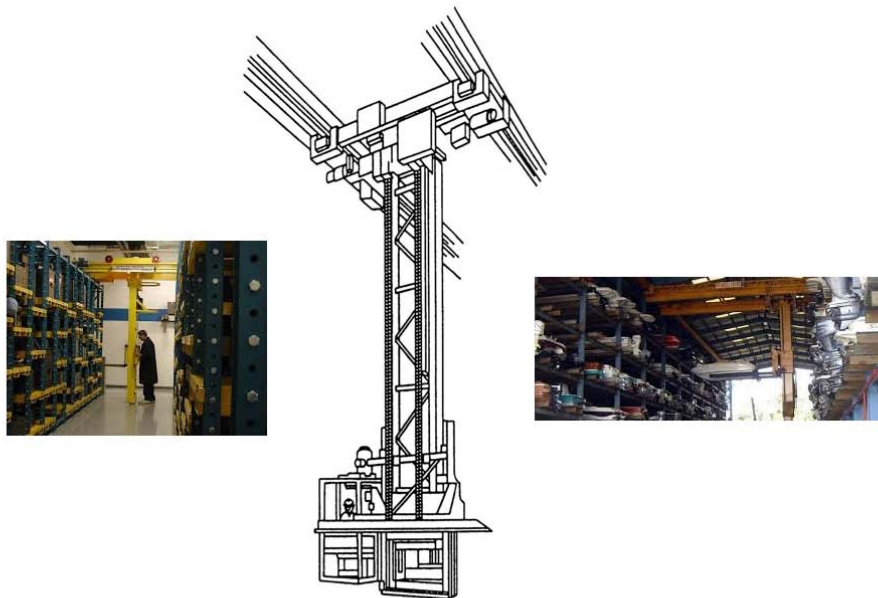
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## STACKER CRANES

- ▶ Engineered AS/RS Stacker Cranes  
These are usually large scale Automatic Storage and Retrieval Systems (AS/RS). They have no hook and look nothing like any other type of crane. They probably have this name because some of the early builders were overhead crane companies.
- ▶ Pre-engineered Manual Stacker Cranes  
These are small scale versions of the AS/RS, but are manually operated and do in fact usually have an electric chain hoist powering the vertical motion.

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## CRANE TYPE IDENTIFICATION IS CRITICAL

- ▶ Without the proper crane type identification;
  - ▶ You can't determine the proper OSHA/ANSI/ASME specs
- ▶ Without the correct specs, you can't;
  - ▶ Define standard practice
  - ▶ Assign responsibility

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**IF YOU'RE CAN'T "ID" THE  
CRANE TYPE, OR ARE JUST  
NOT SURE, PLEASE CALL.**

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Feel free to call if you need help with identifying a specific type of crane in which you're involved.

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The next section in the Lawyers Guide to Cranes Part 2, will be a directory of the industry associations, applicable specs and OSHA regs for each type of crane.

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