

### **PURPOSE/APPLICATION**

To assist workers and protect them from potential injuries in the building/erection of cribbing structures to support piping.

Cribbing is typically built to support or secure pipe in pipeline and facility construction environments. Note: that there have been serious injuries in our industry when pipe has slipped or rolled off cribbing structures and struck workers.

### **PPE**

- Strike minimum requirements

### **TRAINING**

- Line of Fire/Pinch Point (Strike internal) Training

### **HAZARDS & CONCERNS**

- Serious or fatal personal injury
- Equipment/property damage
- Ground conditions that can affect the stability of cribbing



### **RESPONSIBILITIES**

#### **Supervisor/Foreman**

- Ensure that the worker is trained/competent in the building/erection of cribbing structures
- Inspect cribbing before it is used to support piping or other material

#### **Worker**

- HIAC the task and work area for hazards, especially ground conditions and pinch points; assess and implement controls
- Inspect each skid prior to use for integrity and signs of damage, which can affect the strength of the material

### **DEFINITIONS**

#### **Skids**

A wooden block typically measuring 4" x 6" x 4' made of hardwood, used for stacking in a cribbing system to support pipe joints along a pipeline or facility construction site. On some sites and mod yards, skids or dunnage can often be much larger (e.g., 12" x 12" x 3' or 8' long) and used to support/secure larger bore pipe (e.g., 24" to 48").

#### **Skid Piling**

A systematic process of stacking wooden skids to form a sturdy platform in which to secure pipeline joints, which are elevated off ground level for the purpose of aligning and welding individual joints together (various terms and styles depicted below).

#### **Padding**

A piece of material used as a softener between the pipe joint and skids to protect the pipe joint surface coating.

**Wedge**

A wood or plastic designed stopper to ensure that pipes are secure during transportation and storage, from unintentional movement or shift. Wooden wedges are commonly made with medium to hard density woods (i.e., Spruce, pine, and Oak).

**Manufactured Plastic Pipe Cone (Stand)**

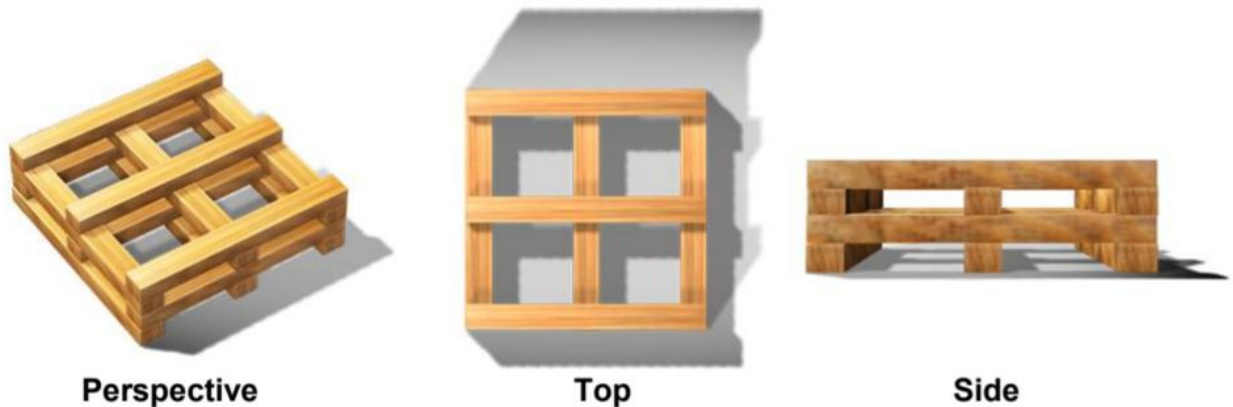
Cones are products made of an UV stabilized HDPE (High Density Polyethylene) with a smooth side cone or star shape. With dimensions between 18" - 24" high with 24" - 41" base and have 3/8" thick walls.

**APPLICATION OF SKIDS AND WEDGES**

Within the system of skid piling, there are 4 standard configurations:

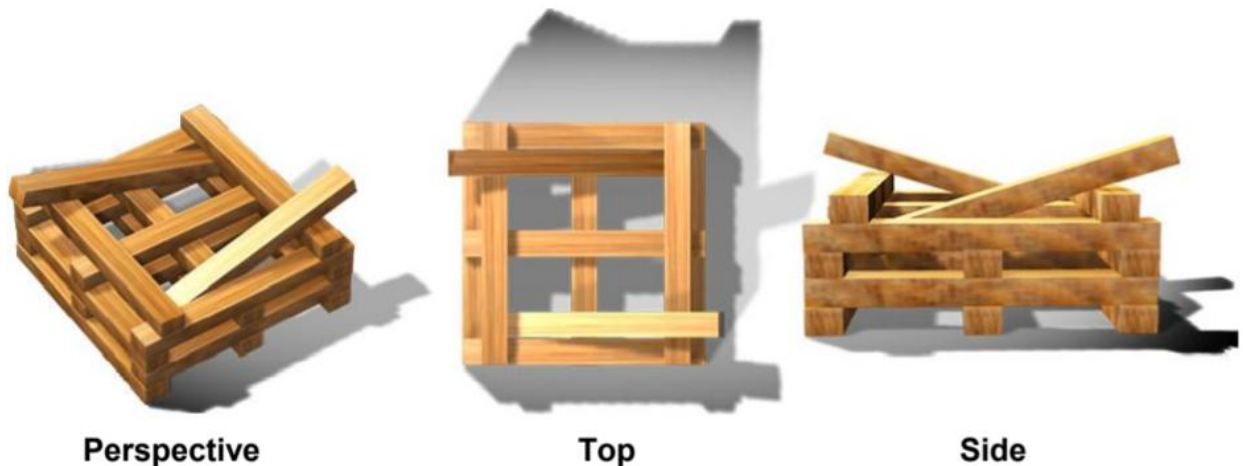
**Blocking**

Stacking skids up in tiers, creating a flat-top surface.



**Crotching**

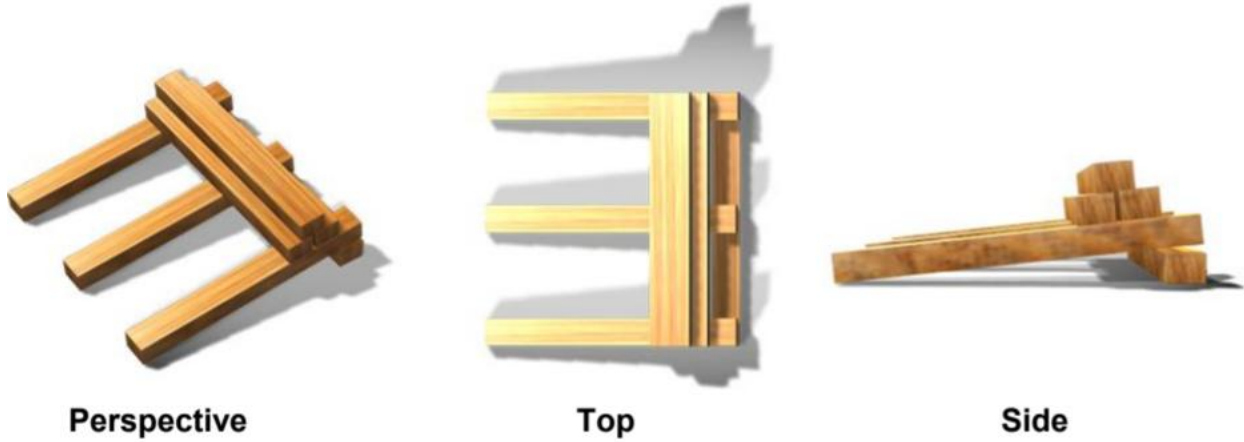
The same as blocking except that at the top, two skids (forming a shallow 'V' one on either side of the pipe) are placed at an angle to help prevent the pipe from rolling off. For added support or a larger pipe, the angled skids should be doubled to two skids on each side. This style should be used at all start joints, side bends, or as terrain dictates.



**Slider**

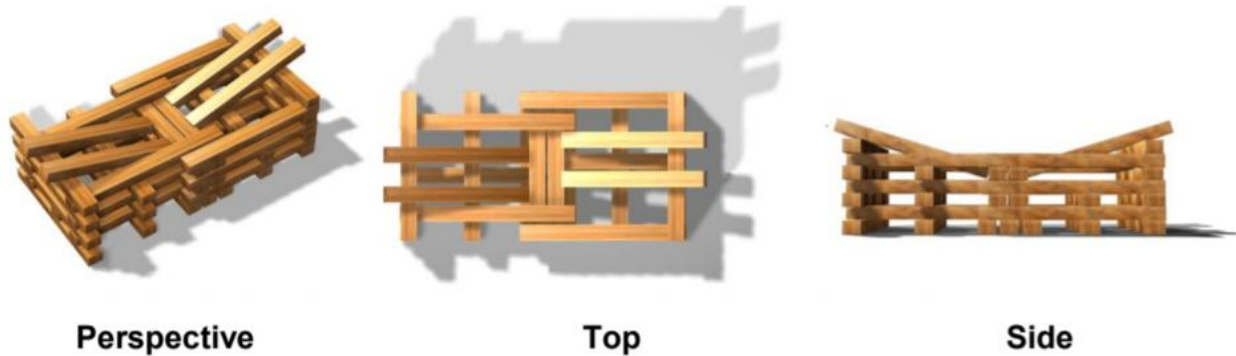
Bottom tier begins at an angle and continues upward with a slight sloping in the cribbing process. This is installed if the pipe is slightly higher at one location due to a bend or sag in the pipe (but the height is

not enough to incorporate another full tier of skids), then a slider block can be pushed upward to meet the pipe section.



**Wide Base Configuration**

For use in soft, wet, unstable soils or if piles will be excessively high. Note: Use of mats or plywood is also acceptable for use under cribbing.

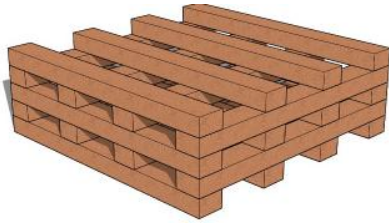


**Weight Requirements**

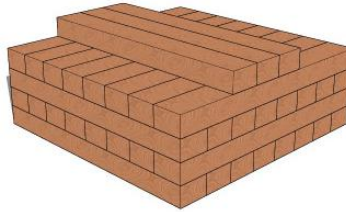
Crib Structure Capacity Based is based on Timber Strength which is measured in PSI, Confirm material strength with supplier.

In cases of large bore or heavy wall pipe, it may be necessary to move from the standard 3X3 blocking to a 4X4 configuration.

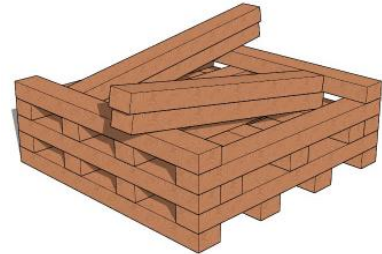
**Blocking 4x4 Crib Set Ups**



**4x4 Box Crib**



**4x4 Solid Platform**



**4x4 Crotch Support**

**WEDGE PLACEMENT**

For use on Skids to aid in supporting and blocking pipes. Used for stationery and transit applications where pipe materials may shift. Wedges should be secured with screws or nails.



## **BUILDING CRIBBING & CHOCKING**

### **THE DO'S**

- DO** Inspect ground/soil conditions prior to building cribbing. Wet, soft, or loosely aggregated soils (e.g., sand) or changing weather/water conditions locally can affect the integrity of the cribbing structure you may build. Matting, plywood, and adding more timbers or other substrates may be needed to ensure a firm or level base. When working in an area where soil conditions may potentially allow skid piles to sink, increase the area of the base by adding more timbers. Consider using a mat or plywood (no less than 1/2 inch thick; 3/4 inch is recommended) under the cribbing to help distribute the weight more evenly
- DO** Exercise extra caution when constructing cribbing near the edge of an excavation, on previously disturbed soil, or adjacent to operating mobile equipment
- DO** Consider the type of wood your skids are built from. Generally, hardwoods have a higher compressive strength and are harder than softwoods
- DO** Consider the time of year. A cribbing structure built during winter conditions may become unstable as the ground thaws in spring
- DO** Use crotched skid piles at a minimum at the first and every fifth joint
- DO** Double crotch skids (use 2 per side) when dealing with pipe 24" in diameter or larger, or when the weight of the pipe dictates. With the weight of this larger diameter pipe, it is very common for skids used in the crotch to break if only one is used on each side
- DO** Use a center support for pipe 24" in diameter or larger
- DO** Communicate clearly when working with others to avoid pinch points and potential injury
- DO** Ensure that the overhang at the corners is no less than 4 inches
- DO** Inspect the cribbing regularly and from different perspectives during and after construction
- DO** Ensure that when setting pipe on flat cribbing structures or dunnage, they are secured against movement using wedges, which in turn are secured with screws or nails
- DO** Use Small Pipe Wedge (4 1/4") recommended for 16" OD pipe and lower, Large Pipe Wedge (6 1/2" – 8") for pipe greater than 16" OD
- DO** Use wedges to keep pipe from shifting in transit due to sharp turns, inclement weather, and/or long-term storage

### **THE DON'Ts**

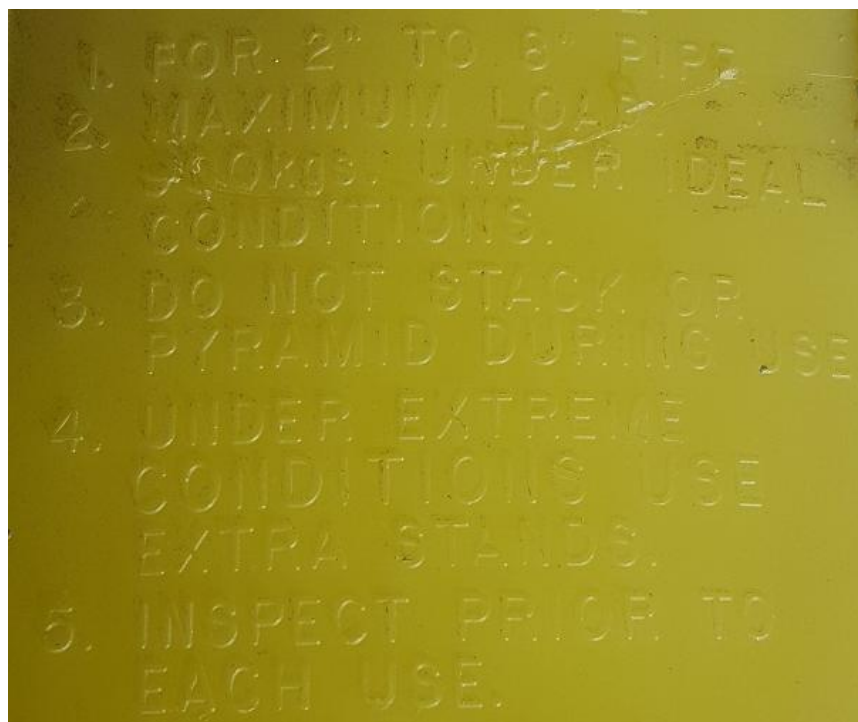
- DON'T** Exceed a distance of 80 feet between skid piles. Cones should be utilized in between cribbing over longer runs (depending on the size of pipe, at a minimum of 6" and up)
- DON'T** Place your hands in pinch points when building skid piles
- DON'T** Trust pipe laying on a flat surface or cribbing to not move. Crotch pipe to prevent movement, or secure with wedges that are screwed or nailed
- DON'T** Use damaged, painted skids, or skids contaminated with oil or grease. Paint can hide cracks that could affect the strength of the wood, and oil can cause slippage
- DON'T** Build cribbing higher than 3 times the width of the base
- DON'T** Use wooden wedges showing signs of imperfections and improper cuts relative to wood grain
- DON'T** Use wooden wedges softened by UV fading and signs of wood rot or molding.

## **APPLICATION OF PIPE CONES**

Stackable Plastic Pipe Cones can range in various sizes to handle multiple pipe sizes, see below table for details. With each size of plastic cone, which can come in multiple colors or all the same color so proper sizing is important as the acceptable safe working load limits ranging from **1,980 lbs. (898 kg.)** up to **10,000 lbs. (4,536 kg.)** (under ideal conditions).

Pipe Cone common sizing and specifications:

<b>2"- 8" Plastic Pipe Cones</b>	<b>8"-12" Plastic Pipe Cones</b>	<b>12"- 24" Plastic Pipe Cones</b>
Yellow Cone Shape	Yellow Cone Shape	Yellow Multi-angled Shape
Overall Height: 21" (53.34 cm)	Overall Height: 24" (60.96 cm)	Overall Height: 26" (66.04 cm)
Saddle Height: 19" (48.26 cm)	Saddle Height: 22" (55.88 cm)	Saddle Height: 20.5" ( 52.07 cm)
Base Diameter: 23.5" (59.69 cm)	Base Diameter: 25.5" (64.77 cm)	Base Diameter: 41.0" (104.14 cm)
Weight: 10 lbs. (4.54 Kgs.)	Weight: 18 lbs. (8.17 Kgs.)	Weight: 42 lbs. (19 Kgs.)
Thickness: 0.2185" (.5549 cm)	Thickness: 0.3125" (.7938 cm)	Thickness: 0.3937" ( 1.000 cm)
Maximum Load: 1980 lbs. (898 kgs)	Maximum Load: 3475 lbs. (1576 kgs)	Max Load: 10000 lbs. (4540 kgs)
Can be stacked 100 per Pallet	Can be stacked 50 per Pallet	Can be stacked 15 per Pallet



**Example of a Rating Stamped on a Plastic Cone:**

The instructions on the example cone include:

1. For 2" to 8" Pipe
2. Maximum Load 900 kgs, Under Ideal Conditions
3. Do Not Stack or Pyramid During Use
4. Under Extreme Conditions Use Extra Stands
5. Inspect Prior to Each Use

**\*Note: not all manufacturers provide a stamped rating on plastic cones, so OEM verifications may need to be completed on older stock cones\***

### **VISUAL INSPECTION DETAILS**

Visual inspection of each cone to identify deformities, cracks, or any other physical issue that could cause a weak point in the structural integrity of these cones is the best way to ensure safe use. Many manufacturers have identified that plastic pipe cones are made of UV stabilized HDPE, and suggest that the cones have an approximate UV life span of 6.5 years; consider replacing any cone past this age.

#### **THE DO'S**

- DO** Visually inspect cones for any cracks, deformities, including melted points, missing components, and general fit for service prior to each use
- DO** Look at ensuring cones are stacked and organized for easy transport
- DO** Make sure cones stacked for storage are consistently rotating the top cone to reduce UV light damage and weakening of material
- DO** Consider the environmental impact when placing cones and ensure damaged cones are recycled
- DO** Use cones over skids to aid in keeping the jobsite clean and clutter-free
- DO** When using plastic cones as part of supports of the pipe being hydrotested, calculate the water mass and place additional wooden skids and crotches under the pipe for the weight load

#### **THE DON'Ts**

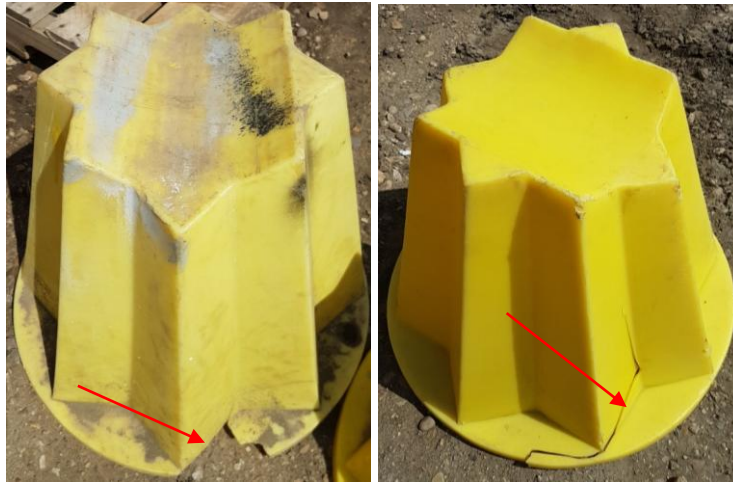
- DON'T** Use cones with visible cracks in the base or side walls in the cone
- DON'T** Use plastic cones only to support piping for hydrotest activities, as added H2O weight can lead to unplanned failures of the plastic cones.
- DON'T** Use cones that have sustained heat stress, causing melting or deformation of the plastic thickness
- DON'T** Use cones that show extreme sun fading, compared to similar cones. As this is an indication that UV rays may have weakened the HDPE integrity
- DON'T** Paint cones as it can hide visual imperfections

### **INSPECTION ITEMS AND SAMPLE DEFORMITIES**

Melted top and base deformities in pipe cone stands.



Cracked and missing parts of the base lip of the pipe cone stands:



**\*Note how paint can hide crack damage on cones\***

Cracked top and side wall of pipe cone stands



