A GUIDE TO MEZZANINES AND WORK PLATFORMS

Expanding *out* costs more than expanding *up*

[cisco-eagle.com/mezzanines](http://cisco-eagle.com/mezzanines) • 888-877-3861
The space you need is usually “up there”

Why Mezzanine Space is the Most Efficient Space

You’re already paying rent, taxes and for utilities of the space in your facility. Even if nearby space is available and suitable, using a work platform to expand makes sense because all these costs are wired in—and don’t typically rise with a mezzanine installation.

The space you have is far more valuable than space you could acquire

Use platforms and mezzanines to leverage your existing space for offices, production equipment, storage areas, manufacturing process, product/conveyor sorting and much more. It’s a fraction of the cost of new construction and delivers long term value. Mezzanines also offer significant tax depreciation advantages.

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Quick links to mezzanine resources

- [Cisco-Eagle Blog: Mezzanines](#)
- [Mezzanine Articles & Tips](#)
- [Mezzanine Home Page](#)
- [Article: When is a Mezzanine not a Mezzanine?](#)
Pre-Engineered Work Platforms for Storage, Machinery, Offices, Processing Areas

Added space at a moderate cost

Mezzanines are the most cost-effective way to add storage and work space to an industrial facility with high ceilings. Warehouses, distribution centers, aerospace facilities and manufacturing operations typically have space in the “air” that a structural mezzanine can take advantage of.

Structural mezzanines are pre-engineered

These work platforms are ideal because they shorten lead times and reduce costs when space is needed. Compared to the costs of traditional construction or new facilities, a mezzanine is the clear winner.

High strength, zinc plated steel bolts combine with heavy duty steel angles to align the framing for uniform installation. These integrated components lock the connection into a solid unit for maximum strength. They provide tremendous strength and load bearing capacity, with low composite heights available.

Structural systems meet the specifications for structural steel construction set by the American Institute of Steel Construction (AISC). In addition, all materials conform to the standards set by the American Society of Testing Materials (ASTM). All systems meet specified national, state and local codes.

Structural vs. rack/shelf supported mezzanines

Structural mezzanines are more versatile in that they can be custom configured for a variety of storage and processing operations. Depending on the storage media involved, they can also offer more weight-bearing capacity. Shelving or rack supported systems are ideal for concentrated storage where you have many inventory positions, or a pick module is specified.

Structural systems shine where you need to support production equipment, integrate a conveyor system, want an in-plant office or lockers, have general storage needs, or manufacturing operations on the mezzanine. They can be built to virtually any shape or size (the listings on the next page are just a few standard sizes, and not indicative of the full range of structural solutions available).
### Pre-Engineered Configurations

Only a small sample of what’s possible—many sizes and configurations available

- You can specify shape, decking, colors, and many other factors. This is only a small sample of what is possible.
- Listed modular platform mezzanines include decking, handrail, stairway, and landing.
- The mezzanines listed are Beam & Beam style construction.
- Standard mezzanines are not designed for point-loading. Contact us for assistance with heavy, point-load applications.
- Steps: 36” wide, 11” deep with 7” rise.
- Stairway landing is 42” x 42” and features a diamond-plate deck. Other sizes are available.
- Guardrail is 2.5” x 2.5” square tubing uprights with 1.5” diameter horizontal tubing. Depending on building code regulations, mezzanines can have two or three rails.
- Height dimensions refer to clearance below the structure. Heights at the top of platform are typically 1/2” taller.
- Mezzanine platform, stairs and landing are finished in gray. Railing is finished in safety yellow. Other colors are available—contact us for assistance.
- All structural mezzanines require approval drawings.

### Code & Seismic Zone Compliance

Meet the specifications for structural steel construction set by the American Institute of Steel Construction (AISC), IBC (International Building Code), and OSHA requirements. If your mezzanine requires UBC (Uniform Building Code) compliance, contact us. All construction materials conform to American Society of Testing Materials (ASTM) standards. Building permits may be required (consult your local building authorities).

Most mezzanine applications are specified non-seismic, outside of California. If you know you know you are in a seismic zone area that requires a seismic mezzanine, see below.

### Detailed modular mezzanine prices, specs and more

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<table>
<thead>
<tr>
<th>Height (Feet)</th>
<th>Width (Feet)</th>
<th>Length (Feet)</th>
<th>Square Feet</th>
<th>Roof Decking Model Number</th>
<th>Wt. (Lbs.)</th>
<th>Bar Grating Model Number</th>
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<td>13,520</td>
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**Fixed Content:**
- Cisco-Eagle
- Industrial Mezzanine Guide
- [cisco-eagle.com/mezzanines](http://cisco-eagle.com/mezzanines)
- 888-877-3861
What to Know About Your Mezzanine Project

How will you use your mezzanine?

Mezzanines are typically used for the following:

- Storage
- Production
- Equipment positioning and support
- Offices/administrative
- Order picking modules

Will it be used for production equipment? Will it integrate with your conveyor system? Perhaps you want it simply to remove certain functions from the floor level. It’s critical to go into the process with a clear understanding of the mezzanine’s role in your operation. Always keep an eye out for future needs and how the mezzanine plays into them.

Where will it be located?

Mezzanines in corners are common, but sometimes they stand free in the middle of a plant floor. This helps you understand if the ceiling is high enough in that area, what power runs are needed and how it flows with your facility layout and design.

Know your facility factors

What is your slab floor capacity? The typical floor in many regions is made of 6” thick concrete and has a capacity of 25,000 pounds. This is the typical capacity, not an across-the-board standard. When you start loading a floor with tons of equipment, you must know its actual capacity.

Floor capacity depends on the thickness of the concrete and how much the soil underneath the slab will compress. Knowing the characteristics of both the floor and underlying soil is critical. See our extensive guide to mezzanines and floor capacities here.

Most mezzanines require minimum 14’ clear ceiling height.

What does each column have to bear?

Make sure mezzanine column base plates are correctly sized. The interior columns of the platform will always bear the most weight due to the fact that they support the most square footage of the platform. If your slab can support interior column loads, then the exterior columns should not be a challenge. Larger base plates can help, but aren’t always capable of compensating for extremely heavy loads. You may need concrete footings in some instances. It’s critical to fully understand the floor, the soil and the amount of weight the mezzanine will bear.

What code applies to you?

Depending on where you are and the function of your platform, you may be subject to IBC2006, IBC2003, or something else. These variations frequently rely on seismic zone, but not always. Well-constructed mezzanines should meet IBC, AISC and ATSM standards. IBC is usually the standard for permitted projects. OSHA stairs and railing requirements should be the minimum standard.

Be certain your guardrails and stairs meet code requirements. If you classify the mezzanine as a work platform (and it’s not usually used as a work area and isn’t publicly accessible) requirements can vary.

Will your mezzanine be point loaded?

Point loading is an unusually heavy, single load or force in a concentrated area. Examples include pallet jacks with 2,500 pound loads, conveyor legs, heavy machinery, or extremely high-load shelving. If your mezzanine will be point loaded, you will need to specify that as your project progresses.
# Mezzanine Decking: What Suits Your Application?

<table>
<thead>
<tr>
<th>Decking</th>
<th>Description</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roof Deck &amp; Resin Board</strong></td>
<td>20-gauge painted steel roof deck (18-gauge available) with 3/4&quot; resin board. Roof deck top is unfinished gray; underside is painted white to brighten the area under the mezzanine.</td>
<td>Most economical system. Satisfactory for most mezzanine floor applications. Good for foot traffic and lighter (manually handled) storage requirements.</td>
</tr>
<tr>
<td>20-gauge painted steel roof deck (18-gauge available) with specialty wood (straight edge or tongue &amp; groove). Top is unfinished gray; underside is painted white to brighten the area under the mezzanine.</td>
<td>Recommended for heavier traffic usage and in-plant offices. Can be painted or coated with moisture-resistant urethane.</td>
<td></td>
</tr>
<tr>
<td><strong>Bar Grating</strong></td>
<td>1&quot; x 1/8&quot; painted steel bar grating (NAAMM).</td>
<td>Open design for ventilation and fire regulations. Heavier equipment is mounted on bar grating at times. Wheeled carts and pallet jacks cannot be used on grating.</td>
</tr>
<tr>
<td><strong>Roof Deck &amp; Floor Plate</strong></td>
<td>20-gauge painted steel roof deck (18-gauge available) with 12-gauge unpainted floor plate. Painted or galvanized steel floor plate over roof deck is also available. Roof deck top is unfinished gray while the underside is painted white.</td>
<td>Recommended where local loads could be abusive or where non-combustibility is required. Can work with pallet jacks or carts without floor damage.</td>
</tr>
<tr>
<td><strong>Roof Deck &amp; Specialty Panels</strong></td>
<td>20 gauge painted steel roof deck (18-gauge available) with specialty panels. Roof deck top is unfinished gray; underside painted white to brighten area under the mezzanine.</td>
<td>Use where non-skid or harder surface properties are required.</td>
</tr>
<tr>
<td><strong>Roof Deck &amp; Concrete</strong></td>
<td>20 gauge painted steel roof deck* with lightweight concrete (not included). The roof deck top is unfinished gray while the underside is painted white to reflect light and brighten the area under the mezzanine.</td>
<td>For fire ratings and/or chemical applications. (Note: Mezzanine is no longer demountable with this option).</td>
</tr>
<tr>
<td><strong>Specialty Grating</strong></td>
<td>Many fiberglass or plastic gratings available.</td>
<td>Use where chemical or non-conductivity properties are required.</td>
</tr>
</tbody>
</table>

- The most important factors for decking decisions are application and budget.
- HVAC considerations are important. Solid floors don't allow air flow, but bar grating does. When a mezzanine covers a large portion of a room, bar grating is considered an excellent option for this reason.
- For steel floors, diamond plate is more durable but more costly than flat steel.

[Click for help with your mezzanine]
Factors for Mezzanine Handrails

IBC code covers most of the continental United States. A few select areas require UBC compliance, which requires 3 rails on the deck, landing, and stairway. Check local building codes to be certain your area is IBC. If you are under UBC code, upgrade your mezzanine to a 3-rail configuration. We can assist you if you’re uncertain on your code status.

- Handrails must be installed on all sides of a mezzanine open to a floor. Placing the mezzanine in a corner can eliminate part of the required railing. Partitions, offices, or other structures that guard a ledge may also reduce rail needs.

- For openings (for forklift access or other reasons), fall protection gates or other safeguards are required.

- OSHA specified 42” handrails with at least two rails. Kickplates are highly recommended.

- Check local code compliance to be sure your handrail design meets requirements. Some regions may require a third mid-rail or wire mesh panels.

Mezzanine Frame Options

<table>
<thead>
<tr>
<th>Type</th>
<th>Bolted C-Section</th>
<th>Beam &amp; C-Section</th>
<th>Beam &amp; Beam</th>
<th>Beam &amp; Bar Joist</th>
<th>Truss Girder &amp; Bar Joist</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>Small - Medium</td>
<td>Small - Medium</td>
<td>Small - Medium</td>
<td>Medium - Large</td>
<td>Large</td>
</tr>
<tr>
<td><strong>Load</strong></td>
<td>Up to 200 PSF</td>
<td>Up to 200 PSF</td>
<td>Not Limited</td>
<td>Up to 300 PSF</td>
<td>Up to 300 PSF</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>20’ (using 12’ C-Section)*</td>
<td>20’ (using 12’ C-Section)</td>
<td>Any size</td>
<td>Any size</td>
<td>Any size</td>
</tr>
<tr>
<td><strong>Span Size</strong></td>
<td>20’ (using 12’ C-Section)*</td>
<td>20’ (using 12’ C-Section)</td>
<td>Any size</td>
<td>Any size</td>
<td>Any size</td>
</tr>
</tbody>
</table>

*If full 20’ span is utilized in one direction, the other is limited to 10 ft. (optimal bay size is 11 ft. x 16 ft.)*

**Advantages**
- Cost effective where smaller bay sizes are acceptable
- Cosmetically appealing
- Short lead time
- Relatively cost effective
- Features longer spans
- Short lead time
- Low composite height available
- Load capacity not limited
- Short lead time
- Wide spans
- Easy to install the mechanical, electrical, and sprinkler systems in one direction
- Wide spans
- Easy to install the mechanical, electrical, and sprinkler systems in one direction

**Limitations**
- Spans over 20’
- Spans over 20’
- Relatively higher costs
- Composite Height
- Composite Height
Comparing Vertical Load Movement Methods

The easiest space to recoup in most every operation is overhead space. Utilizing that vertical cube with a mezzanine means that you need to move material between levels without creating bottlenecks. Usually this means conveyors (vertical or incline), vertical lifts, or forklifts. All of these methods have their advantages and limitations.

**Spiral conveyors: best throughput**

cisco-eagle.com/spirals

- **Space efficiency:** Spiral conveyors are excellent for space efficiency (about the same as a vertical lift, depending on the load) and less than an incline conveyor.

- **Loads:** Utilized primarily for cartons, totes and less than pallet loads. There are pallet sized options, but most applications would not be suitable for unit loads. Can act as a buffer.

- **Throughput:** For very high throughput carton or tote conveying applications, spirals are exceptional. We have utilized them in snack food applications where space was tight and high rates of throughput critical. Spiral conveyor is probably the fastest of these options. Multiple cartons are always packed into the conveyor, where an incline can only do a few (based on capacity rating and spacing) and a VRC typically just one.

- **Cost:** More expensive than incline conveyors, but still economical given the function and correct application.

**Incline conveyors: fast, economical**

cisco-eagle.com/incline

- **Space efficiency:** The least space efficient of these options due to required floor space. In the right application, the lost space can be minimized. Most applications have a maximum 30° incline angle.

- **Loads:** Excellent for cartons or cases. Belt styles (flat, cleated, roller bed) are available for various types of loads. Capacities to 225 lbs./foot.

- **Throughput:** Very strong. They do not act as a buffer, like spiral conveyors do.

- **Cost:** The most economical of these options.

**Vertical Lifts (VRCs): space efficiency and high capacities**

cisco-eagle.com/vrc

- **Space efficiency:** Very strong. VRC’s occupy a relatively small footprint – ranging from 3’ x 3’ to 30’ x 30’ for standard sizes (and the flexibility to configure just about any necessary size).

- **Loads:** VRCs can convey cartons, pallets or even people in limited circumstances. You can specify a VRC that can lift about anything – a car, a fully-loaded pallet, a container – in weight ranges that can exceed ten thousand pounds. Platform sizes are highly configurable, meaning you can convey multiple pallets or stacks of cartons.

- **Throughput:** VRCs lack the product density of a spiral system, but that’s not their role. They’re fast enough given the load profiles they are tasked with.

- **Cost:** VRCs are relatively expensive, but deliver the best multi-level experience for many load types.
Let us assist you!

**About you**
Name: _______________________________________
Company: ____________________________________
Phone: _____________________________
Email: _______________________________________

**Mezzanine and facility factors**
Length: ________(feet)   Width: _________ (feet)
Column spacing: ____ x ____ (ft.) or ☐ most economical

**Application:**
☐ Storage ☐ Office ☐ Shelving ☐ Pallet Jack ☐ Racks
☐ Other : _______________________________________

**Heights (feet):**
Deck _______   Clear: _______  Clear Ceiling: _________

**Capacity**
Maximum Live Load: _____________ (lbs./ per square foot)
125 lbs. is typical; contact us for assistance for heavier loads.

**Guardrails and Kickplates:** _________ (linear feet; excluding landings, stairs and gates; estimated)

**Gates (many safety gates are available)**
Size: _______ (6’ is standard)
Gate Type: ☐ Overhead (safety) ☐ Double Drop (safety)
☐ Lift-Out ☐ Sliding ☐ Swinging ☐ Tilt

**Decking:**
☐ None ☐ 1.5” B-Deck ☐ Bar Grating
☐ 1.5” B-Deck & Resin Board ☐ B-Deck & 12-ga.
☐ Galvanized Floor Plate ☐ Unpainted Floor Plate
☐ Other: _______________________________________

**Applicable codes or standards**
☐ BOCA ☐ SBBCI ☐ UBC ☐ IBC
☐ Other: _______________________________________
☐ OSHA: (Does not imply code compliance)

**Stairs (36”W standard)**
☐ Straight ☐ L-shape ☐ U-shape
#Internal: _____   #External: _____ Width: _______ (inches)
☐ Closed tread/open riser ☐ Open tread/riser
☐ Closed tread/closed riser
☐ Other: _______________________________________
#Landings: _____________ (3’6”W x 4’L is standard)

**Notes**
- Provide any available CAD drawings or sketches. You can use the next page as a sketch area if desired
- List any special jobsite conditions, including cutouts, obstructions, or specialized loads or situations
- Please let us help you—skip any questions you do not understand and we can walk you through the process
Sketch Your Mezzanine

Fax: 972-406-9577 • Email: 24hours@cisco-eagle.com • Call: 888-877-3861

Name:______________________________ Company: _____________________________
Phone:__________________________ Email: ________________________________

Comments:

Sketch if needed:
High-Density Storage Applications

Rack supported mezzanines use pallet rack structure below the mezzanine

Sometimes called “catwalk systems”, these mezzanine configurations are high bay pallet racking with walkways in the aisles between the rack. These racks can be fitted with flow tracks for high-density order picking and mixed storage of pallets along with hand-loaded items in just about any storage scheme you can imagine.

Other configurations include open mezzanines with floor decking that rests on the pallet rack upright columns for support. With pallet rack below the floor, the frequency of support columns is higher, making the mezzanine stable.

The advantage of this type mezzanine is the efficiency of using space above your pallet rack to add square footage to your facility. You now have additional floorspace in which to place more pallet rack, office space, work zones or just about anything you like. You gain formerly unusable space by accessing vertical space in your facility to extend your storage or manufacturing processes.

Components and design factors

Other design elements to consider are stairs, handrails, catwalks, pallet gates and decking materials. Pallet gates and catwalks make loading, unloading and accessing goods more convenient while saving time and labor.

Additional methods of moving materials such as chutes or conveyors should be considered in planning your mezzanine. Traditional forklift placement may not be feasible or wise depending on whether you move by pallet loads or less-than-pallet loads to and from your mezzanine.

Rack supported mezzanines provide many options in how to use the space above the pallet rack in your facility. They’re an economical choice compared to structural mezzanines.
Perhaps the highest density storage possible for bin and each pick operations

Using standard components for support, economical units may be constructed with an open “deck-over” upper level, or additional shelving. In either case, savings are realized because:

- You virtually double storage space in a given floor area
- You utilize existing heat and air conditioning within the building
- Construction is as uncomplicated as standard single level shelving
- Beams and grating supports lock into strong one-piece posts without hardware
- You can endlessly rearrange the shelf spacing and configurations once the mezzanine is in place

The utility of a two-level shelf-supported installation offers unlimited possibilities

Shelf heights are adjustable so you can vary the type of loads throughout a system, even after it’s installed. Bulkier, large loads can be easily accommodated, or smaller bins can be added as needed by adding, moving or removing shelves. In most systems, the only limitation is the width, depth and height of the shelf frame. Mezzanine shapes and configurations are virtually unlimited.

Steel shelving vs. rivet shelving mezzanines

Shelving mezzanines can be steel or rivet/particle board.

- **Rivet mezzanines**: Rivet shelves can be accessed from all four sides, so order pickers in aisles atop the mezzanine are able to work both sides of an aisle. Rivet shelving tends to be more economical than steel shelving.

- **Steel shelving mezzanines**: Steel shelving offers far more options than rivet shelving, including modular drawers, dividers, doors, and other functionality. Due to its cross-braces, many steel shelving brands don’t allow for access from both sides (some types of steel shelving does allow this).

Shelving mezzanines are frequently deployed in parts rooms, inventory areas, secure inventory applications, and similar high-density areas.

Click for help with your shelving mezzanine
High-Density, Accurate, High-Throughput Systems

cisco-eagle.com/pickmodules

Pick modules create first-in, first-out rotation and increase picking productivity by using gravity to flow product from stock to picking aisles. 4 pick shelves with as many as 8 lanes of flow storage per shelf fit into a typical 8’ rack bay. Plug that into a series of modules along a conveyor line, and you have high-density storage that drives fast, accurate order picking in a compact vertical footprint.

Scaled to your needs

While there is no such thing as a standard pick module, they all share common traits. Pick modules integrate various storage solutions inside multi-level work platforms that move product efficiently through a distribution facility. These levels can include static storage, flow storage and conveyors.

The anatomy of a pick module

These order picking systems are multi-level, and combine elements of mezzanines and work platforms with conveyors, spirals, carton flow racks, pallet flow, static racks, and sometimes carousels, or other equipment that delivers loads for pickers on each level.

They produce faster picking in less space than floor level storage. This results in significant cost savings for broken pallet, full-case or open-carton picking functions. This reduces wasted “walk time” for pickers, who are situated in areas where they spend more time picking orders and less time finding SKU’s. Orders are typically conveyed away from the pickers to packing and shipping. This reduces picking times and increases accuracy. You can integrate pick-to-light or voice directed picking into your system to provide fast, accurate order fulfillment.

How can a pick module enhance your business?

- You can enforce inventory rotation through first-in, first-out picking. Replenish inventory from the load side and your pickers are always presented product in the order you want it picked.

- You can save space. Serious space. In a pallet picking operation, you’ll save about 35% in a typical 6-deep application. If you’re picking from cartons or totes, the savings are even better compared to shelving. Saving space delays having to move to larger facilities or the need for wholesale redesign because pick modules open up floor space to other uses. The more vertical cube you can utilize, the more space you’ll save.

- You can reduce labor expenses. It’s easy to see that when you concentrate storage and picking operations, you eliminate nonproductive “walk” time. Order pickers are picking - not walking - for more hours every day. This allows you to greatly reduce the amount of time pickers spend searching and walking.

- You can replenish your inventory easier than ever. Because you’re concentrating picking operations, you can focus inventory, whether pallets or cartons, right into the system.

Click for help with your pick module project
Mezzanines and Pick Modules Fall Prevention

cisco-eagle.com/mezzgate

Quick points on elevated platform safety gate systems

- Safety gate systems are ideal for mezzanines and pick modules where workers must interface with a temporarily open edge (such as when a forklift is loading or unloading from the ground, or pick lanes end at conveyor lines).

- Rotating gates allow a pallet to be loaded from the platform while the gate is closed to the ledge. Once it’s opened, the gate closes on the mezzanine, helping prevent worker access to open space.

- When edge gate is open, inside floor level gate closes to create a three-sided enclosure around the load zone and prevents workers from approaching the mezzanine edge. As the inside gate opens, the edge gate lowers to close off the open edge.

cisco-eagle.com/pickarms

Arms open when pallets are placed, close as unloaded, to help prevent falls. Won’t push open from inside.

Swing gates for platforms, catwalks, dock doors, mezzanines and more

cisco-eagle.com/swing-gates

These gates are ideal as safety gates for ladders, catwalks, mezzanines, elevated platforms, and much more. Easily attaches to existing mezzanine ladder or stair handrail for guarding platforms, catwalks, ladder openings, etc.
What Type of Platform Fits Your Needs?

**ErectAStep** lets you assemble modular platforms, crossovers, catwalks that fit your exact need

cisco-eagle.com/erectastep

Create maintenance platforms, elevated work areas, ladders, catwalks, crossovers, and other structures.

- Easy to assemble, reconfigure, move, and install
- Can ship in days—unlike fabricated solutions that take weeks
- Add components easily and quickly
- Ideal for areas that would be difficult to install welded systems (rooftops, pits, difficult to reach places)

**Welded crossovers & stair systems**
cisco-eagle.com/crossovers

When conveyor, pipe, channels, conduit, machinery, and other obstacles make getting from one place to another difficult, consider a crossover. We can help you design and implement structures to help make any part of your operation accessible.

- Welded platforms are less costly than modular solutions, but may take longer to ship or specify
- Welded platforms can be built to nearly any specification
- Be sure your system is OSHA compliant (the same rules for mezzanine handrails applies to crossovers/platforms
- Ladder style crossovers are ideal for conveyor applications, where space is tight in a production or picking line
- Look at 45° crossovers for “u-shapes”

Click for crossover assistance