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Wall Hanging Systems

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Wall Hanging Systems

Presented By: AS Hanging Display Systems

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Purpose and Learning Objectives

Purpose:

From classrooms to boardrooms to living rooms, hanging display systems enhance spaces and provide design freedom. This course examines wall hanging systems with a focus on integrating systems in the overall design of a project and includes discussions on system elements, selection criteria, specialty applications, and sustainable design.

Learning Objectives:

At the end of this program, participants will be able to:

- describe the benefits of using wall hanging systems in terms of maintenance, difficult walls, high-value wall situations, and design freedom
- list the basic system elements and summarize the role they play within the system in relation to support, adjustment, and design
- compare the various cable-based suspended or tensioned hanging systems and explain the selection criteria used when choosing the appropriate system
- specify creative ways of integrating hanging systems into traditional and specialty project designs, and
- state how the reduced maintenance associated with hanging systems can contribute to sustainable design objectives.

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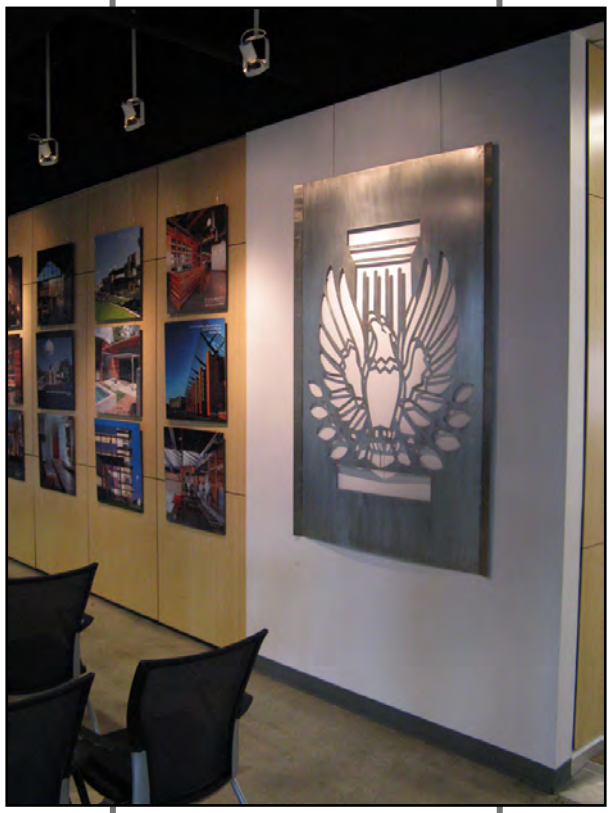


Introduction / History

Victorian to the Arts and Crafts Era (1880's-1920's)

During the Victorian period, and again during the Arts and Crafts movement, picture rails were commonly built into both residential and commercial structures. This was particularly important to Victorian interior décor practices for two reasons. First, walls were made of lathe and plaster, and the brittle plaster was prone to damage if a nail was driven into it. Second, Victorian style often called for elaborately covered walls with expensive textured fabrics and coverings; damaging these finishes was to be avoided.

In Europe, perhaps because of the relatively larger numbers of vintage structures, the population became accustomed to using "hanging systems." In the early 20th century, when architecture and interior décor moved away from incorporating picture rails into new construction, a specialty hardware niche that served this void sprang up.

Present Day

Today in Europe there is wide acceptance of hanging systems, particularly for use in residential applications. The systems are so common that European “big box” DIY retailers offer such hardware as consumer-packaged goods. North America is a few decades behind Europe in acceptance of this specialty hardware, but it is nonetheless growing rapidly. Some of this growth is caused by the “Green Movement” and some by simple inertia. One U.S. vendor makes their line of specialty hardware available in a packaged goods format to niche retailers such as artist supply stores and custom framers. However, for the most part, hanging systems in the North American market are typically available direct from the manufacturer or from a distributor affiliated with a European manufacturer.

The market is loosely split between two segments. The first segment is a “demand-pull” driven market composed of sophisticated residential users who have been exposed to these solutions during travels in Europe or by visiting higher-end galleries and museums. The other major market segment appears in both residential and public/commercial projects, whose design is driven by forward-thinking professionals who specify hanging system components to solve very specific objectives such as LEED points, general sustainability, or specific micro objectives. This second category is spec driven.

Primary Benefits

Primary Benefits

Implementing “hanging systems” into new construction as well as retrofitting within existing projects allows for:

- reduced maintenance - LEED
- the placing of objects on difficult walls
- the placing of objects on otherwise avoided walls, due to surface material or restorative or historical renovation work.
- design freedom

Reduced Maintenance

- No more holes to patch and repaint
  - Sustainability

A significant benefit to those occupying a project where hanging systems have been implemented is the significant reduction of damage done to walls from the use of common hangers (nails) when hanging, and ultimately moving, wall objects. This is a very large sustainability issue and will be addressed in more detail later in this presentation.

Difficult Walls

- Masonry walls
- Pocket door cavities
- Curved walls
- Glass walls, etc.

Hanging system hardware solutions allow for the presentation of art, signage, etc. on walls and locations that are otherwise very difficult display sites. The challenge may be the result of a hard or brittle structure such as masonry. Driving a nail, or repairing the damage caused by a nail, forces many facility managers to set a “no art hanging” policy in such spaces. This is particularly onerous in certain classes of structures, such as schools (K–12 and higher ed.), where masonry block construction is common, yet the need for display space is at a premium.

An example of a problematic wall location is the cavity created by a pocket door. A hanging system track is most frequently mounted well above the cavity, thus allowing the wall surface in front of the cavity to be equally available for hanging art, and other objects.

Difficult Walls

Here is an example of a system simultaneously solving two difficult issues at once: a curved wall and one that is made from masonry block.

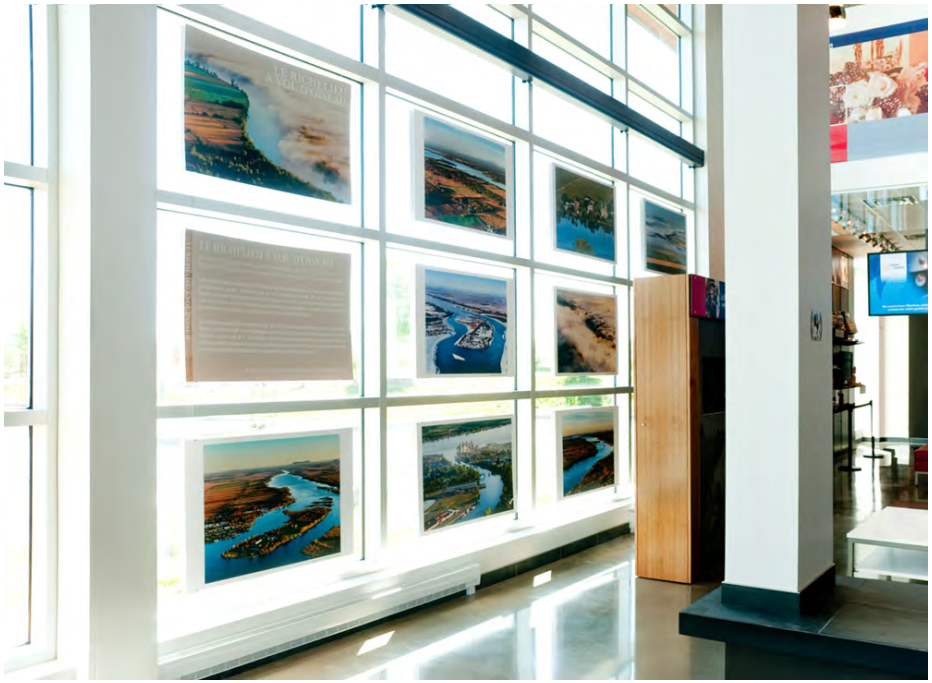
Curved walls bring their own challenges. If an object is attached directly to the surface of a convex wall, depending on the size of the objects and the radius of the wall, the corners of the object “fly free” from the surface. In a concave application it may be challenging to attach the art with the void that appears behind the center of the object.

This “curved wall system” incorporates a track that uses spacers so the track is offset about a half inch in front of the wall surface. This “space” is absorbed by the system to “average” the distance between the wall and object.

Difficult Walls

Glass walls are another example of just such a difficult scenario where art, signage, or other content is particularly challenging to mount.

Here, a double-sided hook display format was chosen that not only handled a difficult mullioned window wall for the inside view but also allow provided this office a means to advertise to outside at the same time. The double-sided hook, allowed the office the flexibility of repeating the same display as the inside, or use a completely different display to the viewers outside. Furthermore, this window display helped to mitigate the bright sunlight that streamed into the room as well.



Avoided High-Value Walls: Panel Systems

There are a wide variety of wall types and surface finishes that cause certain walls to fall into a category we collectively refer to as “high-value” walls. These are walls that are particularly difficult or expensive to patch, repair or refinish. Some walls are simply not repairable, and pounding nails or common hangers into them should be avoided altogether.

This example, the office of the Colorado State Lt. Governor, is finished with vintage hardwood paneling. Here, the designer specified a close-faced track that was faux painted to match the vintage wood. In these offices, where the occupant changes quite frequently, much more so than the average white collar office space, these vintage walls are now partnered with a system that will limit the damage done by large egos and frequent change. Matched with very discreet cables, the system is barely noticeable.

Avoided High-Value Walls: Wood-Finished Walls

Here, in the Oregon State Governor's "Ceremonial Office," an open-faced system was used and mounted into the natural paneling joints. This allows it to become recessed into a "low area" of the wall. Such a system allows wall objects to be moved or reset for various functions with little effort and no wall damage.

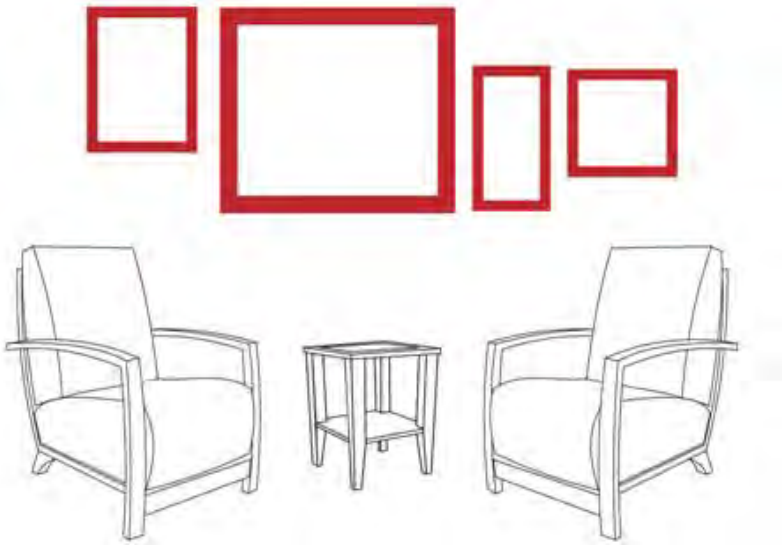
Avoided High-Value Walls: Craftsman Finished

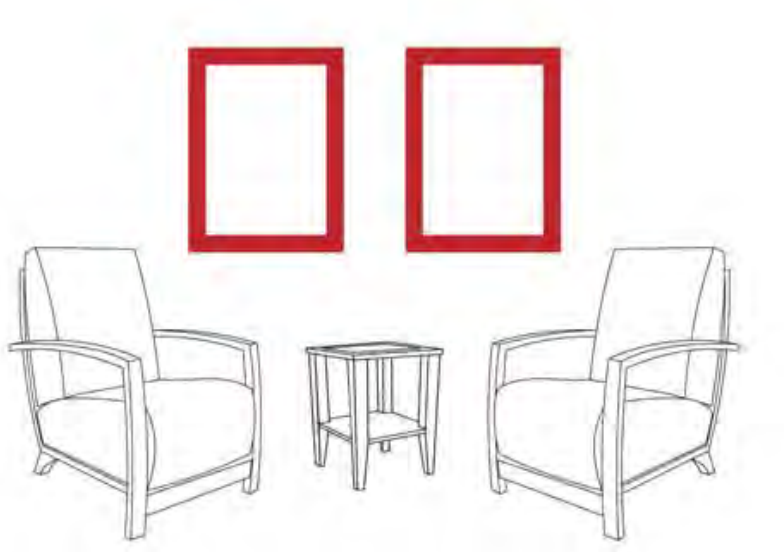
Perhaps a less obvious category of “high-value” walls is where wall finishes are achieved through intensive labor. These craftsman prepared walls include Venetian plaster, faux painted, clay finished, and those to which custom wall coverings have been applied. These “high-value” walls may be virtually impossible to patch and repair adequately, so all means should be taken to avoid puncturing their finish with nails and common hangers.

Source: With permission, Vahallan Papers, Lincoln, NE

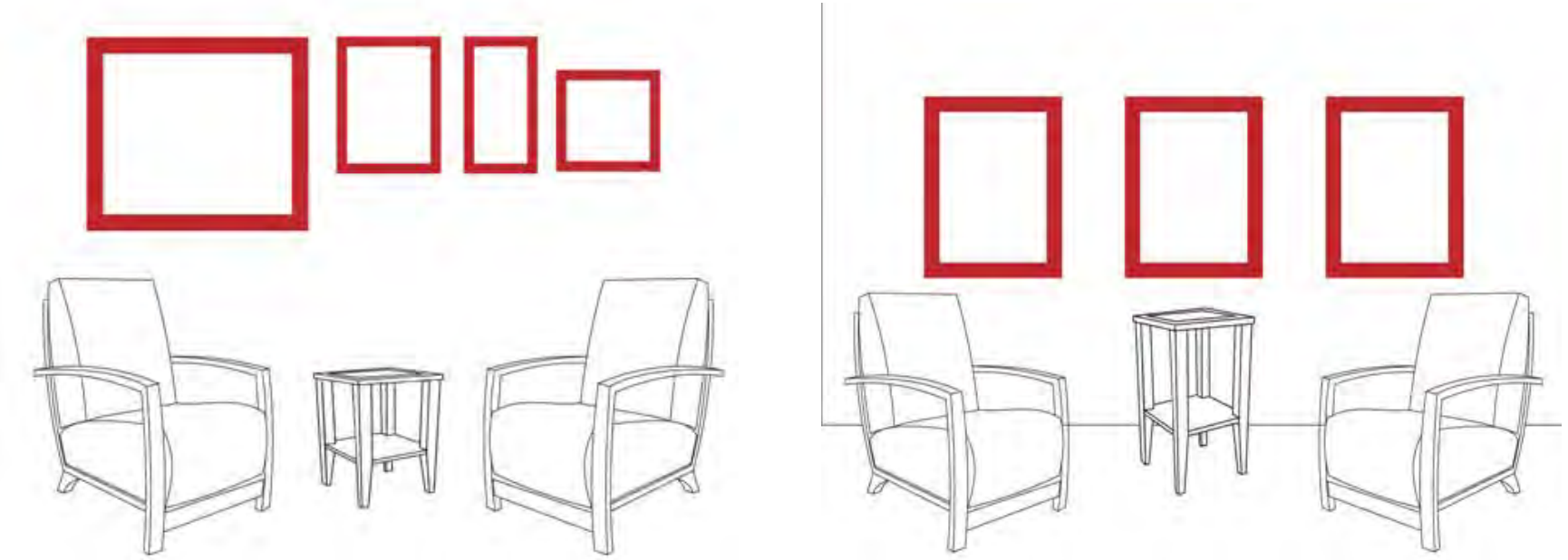
Design Freedom

The least obvious benefit from the use of hanging systems is in the freedom of design that they bring to the interior space in which they are deployed. This is a benefit that is rarely appreciated except through use. Whether the space is residential or commercial, change happens. When furniture is moved, it typically affects wall object placement as well. Hanging systems reduce the hazards and difficulty in changing wall object placement. As a result, wall objects may be repositioned at will, with no detrimental effects and little labor. You are free to design.





Design Freedom

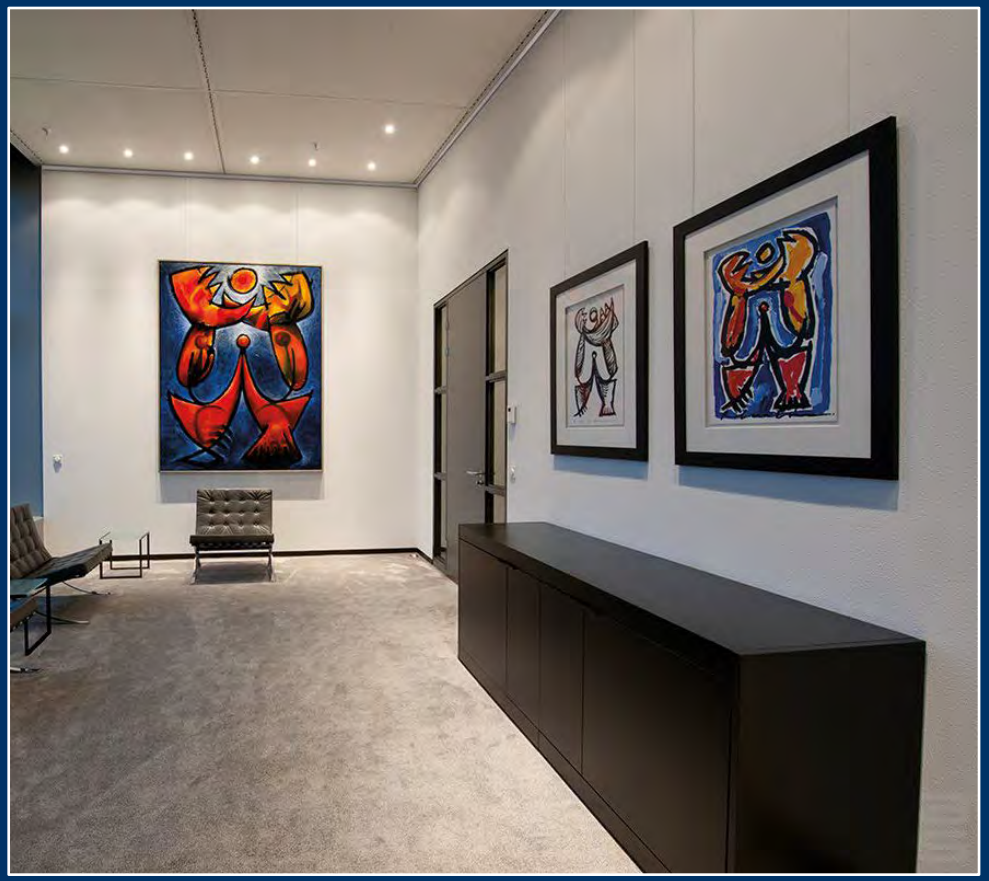


The same benefit—design freedom—is evidenced in many other situations besides repositioning furniture. Some of these include:

- changing object locations with the seasons or seasonal decorating
- easily changing employee notices without having to consider size or location, and
- facilitating custom notice boards with fast and easy changes. These also include a leading edge bulletin board concept, menu boards, and “brag walls.”

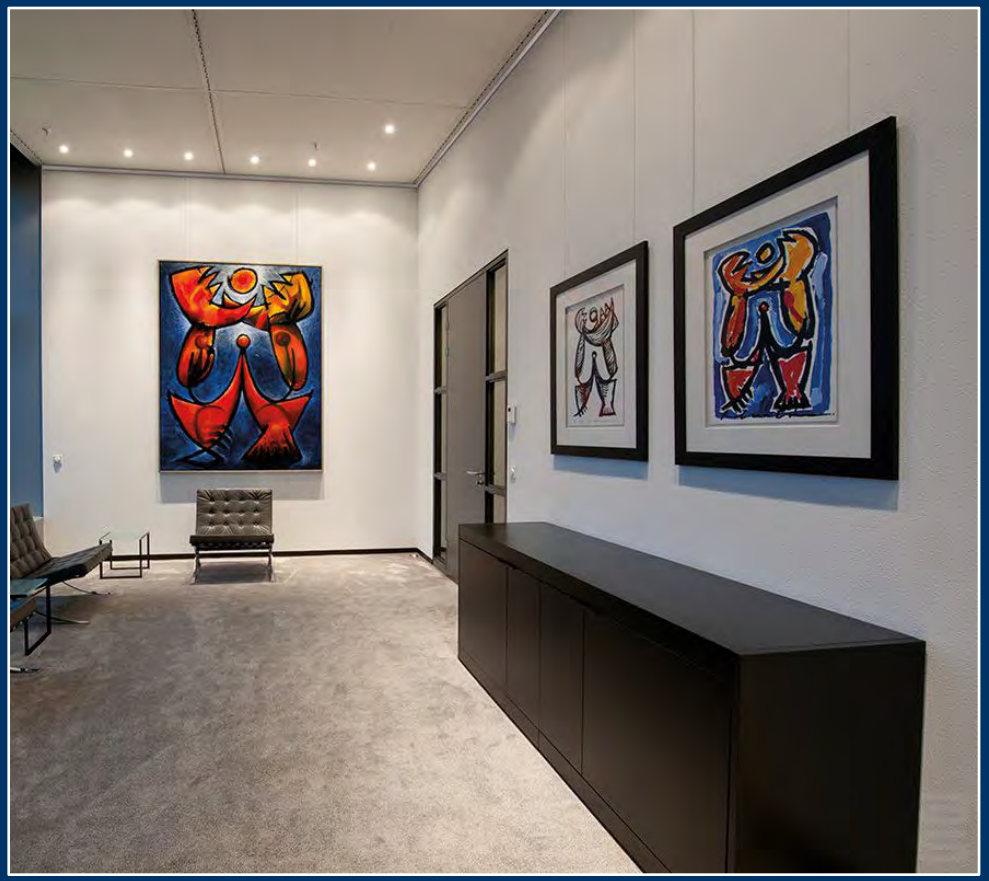
REVIEW QUESTION

What are the four primary benefits of implementing hanging systems into new construction as well as retrofitting within existing projects? Give an example of each.



ANSWER

1. Reduced maintenance
   - No holes to patch and repaint
2. The placing of objects on difficult walls
   - Masonry, curved, glass walls, pocket door cavities
3. The placing of objects on otherwise avoided walls
   - Panel finishes, wood and Craftsman finished walls
4. Design freedom
   - Wall objects and furniture repositioned at will; wall items easily changed



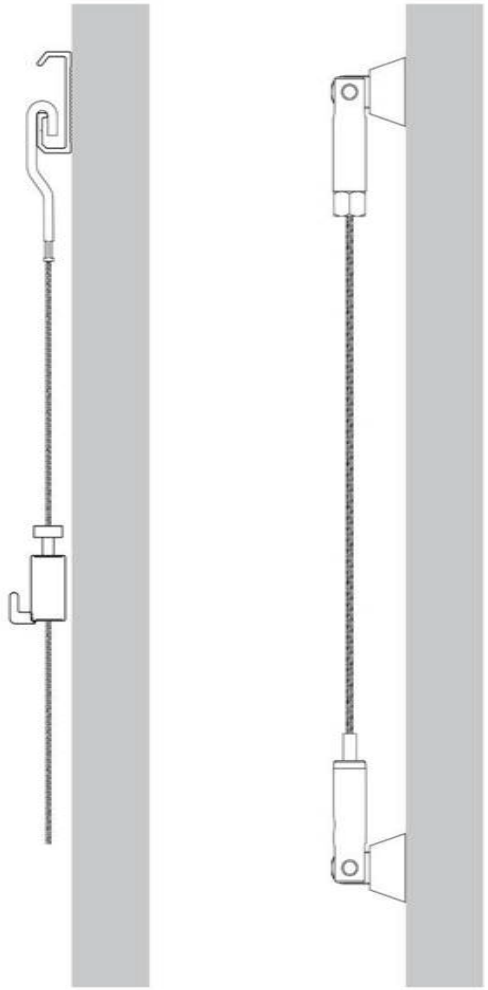
Basic System Elements

Basic System Elements

- Horizontal Member - Track/Stand-Off
- Vertical Member - Cable/Rod
- Hooks & Fittings

Here you can see the basic elements of any hanging system. First, there is a track that is horizontally mounted to a wall or ceiling. Next is a cable or rod that hangs vertically from the track. Lastly, there are a variety of hooks and fittings that act to attach a wall object to the system.

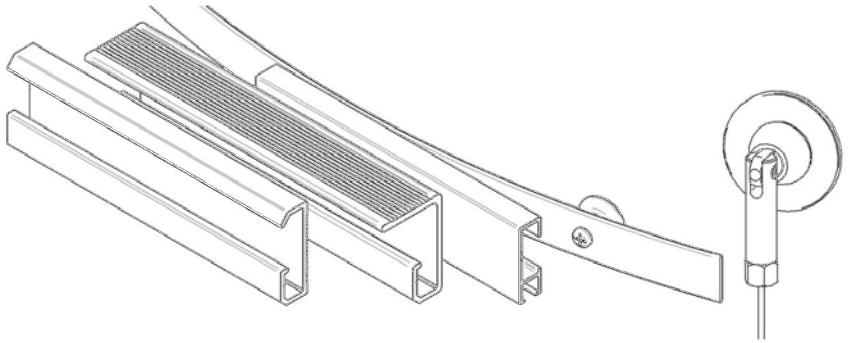
Alternatively, as shown on the far right, stand-offs may be used as the support mechanism in place of a track.



Horizontal Member - Track / Stand-Off

Point of Support

- Supports weight of the system
- Track offers infinite left/right adjustment
- Stand-offs offer design elements



There are various track designs. They each offer trade-offs against several variables: weight capacity, discreetness, color options, etc. Here you see (from left to right) an open-faced wall track, ceiling track, close-faced wall track and a track using small stand-offs as a design element. What they all have in common is that they support the weight of a system and the object placed upon it. Tracks also offer infinite flexibility of left and right object placement.

Tracks from various vendors are typically available in 6-foot or 2-meter lengths (6.5 feet) and are generally made of extruded aluminum.

An alternative is to use stand-offs in lieu of track. The trade-off is in favor of independent design elements that stand-offs offer against infinite flexibility of placement offered by tracks.

Vertical Member - Cable / Rod

Steel Cable/Nylon Cord/Aluminum Rods

- Supports a “column of material”
- Provides for infinite up/down adjustment

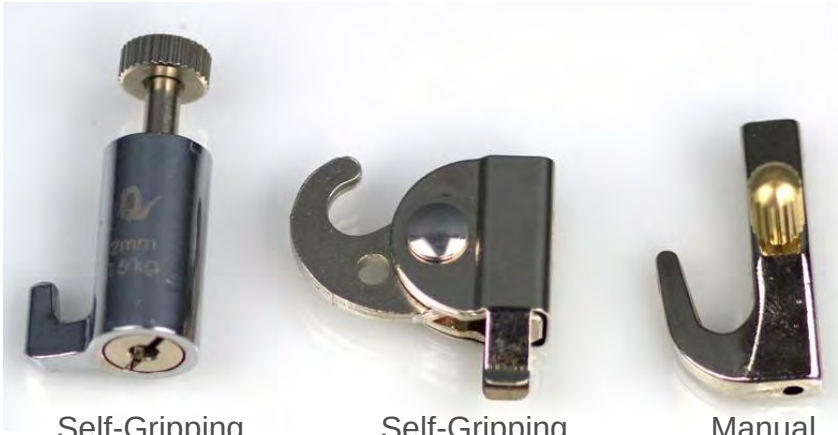
Depending on the track selected for a project, there could be numerous options from among various vertical members. These could consist of steel cables, nylon cords, or aluminum or stainless rods. These are generally manufactured in various lengths and end-fittings to match the chosen track.

Some open-faced tracks will generally accept either cables or rods. Most cables are stainless steel and made of “7 around 7” twisted “aircraft cable” in a diameter ranging from 1.6 to 2.0 mm (1/16 to 5/64 inch). Rods generally range from 4 mm (5/32 inch) to 8mm (5/16 inch) in cross-section. Various vendors offer different diameters, and hooks/ fittings that attach to the cables/rods are generally only compatible with those from the same vendor.

Point of Attachment - Hooks & Fittings

- Supports an object
- Specialized for particular application
  - Specialized fittings for finesse

The purpose of the various hooks are to attach and transfer the weight of a wall object to the hanging system. All the hooks from various vendors can first be grouped into one of two categories based on their mechanical design: they are either “self-gripping” or “manual.”



Self-Gripping for Cables | Self-Gripping for Rods | Manual for Cables

Self-gripping hooks are the most convenient to use. They usually employ a cam or ball-bearing design in which the weight of the wall object acts against the self-gripping mechanism to tighten the hook in place. These are typically a bit more expensive than manually actuated hooks, but their convenience pays dividends in applications that require frequent changes to a display or where the location may be precarious, such as when the installer must use a ladder. Other fittings, besides hooks, add other very specific capabilities, and may be specified to best finesse the system and presentation. Some of these capabilities include such benefits as added security or to stabilize a framed object so it best presents in your project.

Track Selection Considerations

Open-Faced vs. Close-Faced

- Discreetness
- Strength
- Convenience
- Versatility

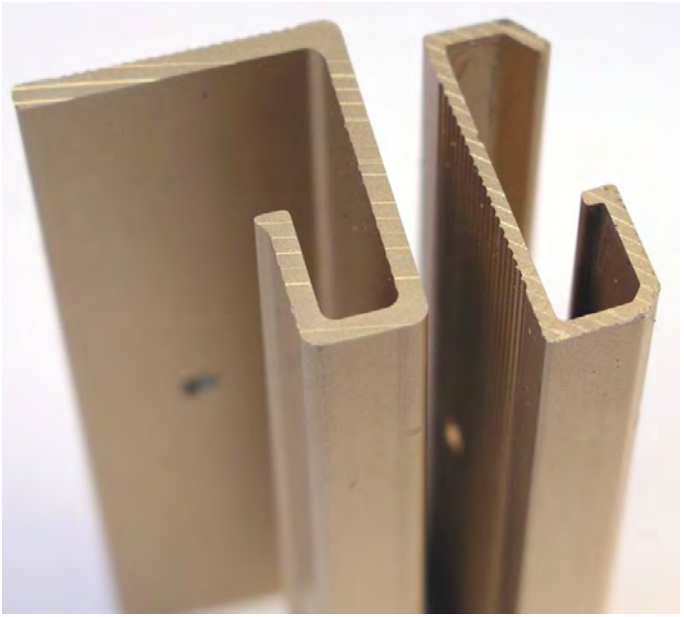
Open-faced (left) and Close-faced tracks
Note: The mounting surface would be to the right.

One of the central decisions in specifying a particular track is in deciding on open- vs. close-faced track design. This decision affects the “discreetness” of the system as much as any other. Open-faced track reveals all mounting screws and hardware, while close-faced track hides these. An open-faced track is typically more versatile and convenient in use, and many tracks are compatible with both cables and rods. Open-faced design is also typically stronger, meaning it has a higher weight-bearing capacity in situations where that is an important consideration. However, superior strength, usability, and versatility are often trumped by clean, discreet lines. For instance, the close-faced track design (pictured on the right) is mounted by snapping it over supplied clips so all mounting hardware is hidden from view. This is a frequently desired attribute, particularly in residential projects.

Wall vs. Ceiling

- Is the wall capable of supporting track loads?
- Is the wall construction such that it should not be punctured?
- Is the wall surface too irregular?

There are situations when a track cannot be mounted to a wall. Examples of these are when the desire is to set a hanging system in a store front window, a glass wall of a conference room, or another solid glass surface, and many historical renovation and restorations. Likewise, the wall backing a hanging location might be very irregular, such as one made of stone. Or perhaps the wall is of a precious surface material and the client simply says, “No.”



Ceiling Track and Open-Faced Wall Track

For these circumstances, some vendors offer a ceiling track option. The “ceiling track” (left) may typically be mounted to most any overhead vertical surface such as a ceiling, window header, soffit, or other return surface. A ceiling track, such as the one pictured, may be mounted in either an open-faced or close-faced manner.

Weight

This photo depicts four popular tracks from a leading hanging systems vendor. From left to right they are referred to generically as “open-faced wall track,” “ceiling track,” “close-faced wall track,” and “stand-off wall track.” There is a sizeable difference between the rated weight capacity of each of these tracks. This open-faced wall track will support 300 lbs., ceiling track is rated for 150 lbs., while the last two will support 78 lbs. each.

As the specifier on a project, these data may further be interpreted as the weight each length of track can safely support along their two-meter length. These capacities are large enough to meet the needs of most building applications; however, one vendor also makes available a specialized track for extreme applications that will support up to 600 lbs. per eight-foot length.

Care should be taken to note that these are the rated weight capacities for tracks. Each vertical member and fitting also has a rating, and these must be taken into consideration.

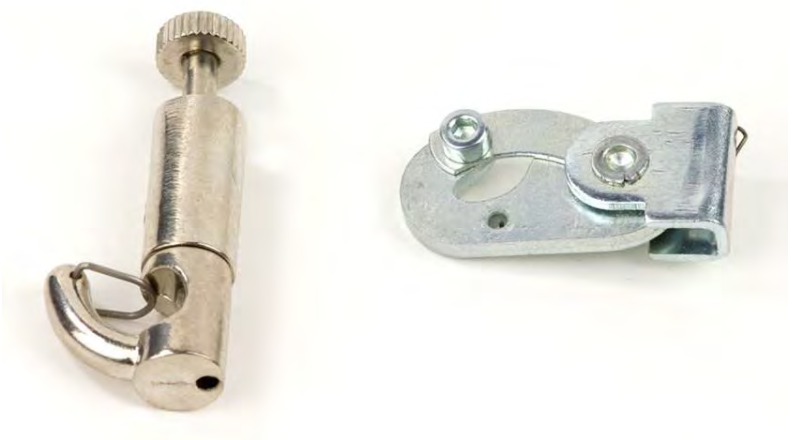
Curved Track

Occasionally, a design requires a hanging system to be mounted to a curvilinear wall instead of a linear one. The hanging systems market addresses this need as well. The track pictured to the right is capable of supporting cables or rods on linear, concave, convex, and serpentine walls. It will follow a radius as small as two feet and is shipped flat to the job site and flexed into the desired profile during installation.

This track is compatible with many variations of cables and rods.

Security / Anti-Theft

Another deciding factor in track selection is the need for a “secure” or “anti-theft” solution. In hanging systems’ space, the term “security” is used to describe attributes of a system that “when used with other recommended components, will resist an object from becoming dislodged by means of an errant bump.” Such components are often specified when a wall object is mounted above a chair or in a high traffic area, or to retain objects from falling during a moderate earthquake.



A security capability is usually accomplished by the hook behind the wall object. Pictured on the left is a security hook that deploys a security bail, not unlike a carabiner, and is compatible with a cable-based system. The specialized hook on the right serves a similar service for a rod-based system. However, these hooks do not provide true anti-theft capability, at least not on their own.

Security / Anti-Theft

Most “anti-theft” solutions within the hanging systems specialty are intended to reduce “theft of convenience” or “malicious theft.” These can be defined as the kinds of theft that occur by non-professionals and, oftentimes, by basically honest people that suffer a momentary lapse in judgment. Anti-theft solutions delay the nefarious act long enough to keep honest people, honest. These solutions can be circumvented, but they will draw attention to the wrong-doer. The delay in time and added attention is intended to stress the perpetrator and allow time for the conscience to regain control.

While an open-faced track may generally offer security capability (when matched with other adequate fittings), it does not offer anti-theft unless it is matched with rods. Close-faced tracks may offer either security or anti-theft capability when used with cables and suitable fittings.

Security / Anti-Theft

While cable systems can be configured to exhibit some anti-theft characteristics, when considering this attribute, rod-based systems are better performers. By combining a rod hook with the appropriate rod (and other fittings), the W Hotel (*aloft* brand) accomplishes a very discreet and anti-theft solution for their in-lobby display gallery pictured to the right.

In order to achieve a preferred anti-theft solution based on rods, the installation must deploy a suitable track such as the open-faced wall or ceiling track described earlier.

Color and Design Implications

Vendors may offer tracks in a number of colors and finishes. This photo shows the breadth of colors available from a vendor for a popular close-faced wall track. Further, with ample lead time and sufficient volume, this vendor offers to deliver product in a custom anodized, powder coat, or metal plating finish. Factory supplied finishes like this may help your project contribute to LEED certification under the IEQ Credit 4.2, Indoor Air Quality specification.

Of particular note is the silver finish (two options) which are generic or “chameleon” for the cool portion of the spectrum, and the counterpart, champagne (third from bottom), for the warm side of the spectrum. These are described as “chameleon” because these finishes tend to take on the colors that surround them.

Color and Design Implications

This particular track is also available in two white finishes: one is a semi-gloss warm white shade to accommodate many interior trim specs, and the other is a matte-finish cool shade of white. The matte finish may also be considered a primer coat, making it ready for field repainting to your spec. No other track is available in such breadth of finishes. Choice of surface finishes will often influence track selection.

There are other projects where track height and/or other design implications will indirectly dictate one track over another. For example, in a highly designed space, where an architect or design professional is involved, there is less likelihood that an open-faced track will be deployed in the line of sight. On the other hand, if the track is to be mounted well above, then an open-faced track, which facilitates rods (more on that later in the program), may in fact be preferred.

The opportunity exists to mask the track with finish carpentry or casework. Some tracks lend themselves to this approach better than others, and this attribute of design will be discussed shortly.

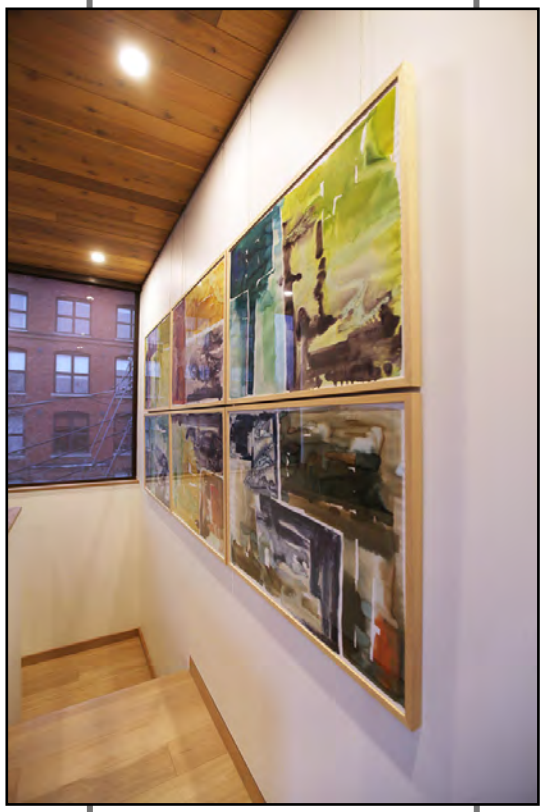
REVIEW QUESTION

Compare the track designs pictured here.

ANSWER

Open-faced track (left image) reveals all mounting screws and hardware, while close-faced track hides these. An open-faced track is typically more versatile and convenient in use, and many tracks are compatible with both cables and rods. Open-faced design is also typically stronger, meaning it has a higher weight-bearing capacity. However, superior strength, usability, and versatility are often trumped by clean, discreet lines.

For instance, the close-faced track design pictured on the right is mounted by snapping it over supplied clips, so all mounting hardware is hidden from view. This is a frequently desired attribute, particularly in residential projects.



Selection Criteria – Vertical Members

Cables vs. Rods

Cables are far more popular than rods in all but the most critical of hanging systems installations, such as in galleries and museums. Cables are more discreet and offer a much smaller cross-section (<2.0mm diameter), and cables may terminate behind the wall object. This is not the case with a rod-based system, and this single attribute greatly defines the discreetness of a particular installation. Cables may also be deployed in a suspended (hung from above) and a tensioned (supported from above and tensioned to a lower point) manner.

Attribute	Cables	Rods
Discreet	X	
Terminate Behind Object	X	
Suspended	X	X
Tensioned	X	
Strength		X
Convenience		X
Selection	X	
Anti-Theft Capable		X
High-Mounted Track		X

The umbrella term “cables” used in this program includes all “non-rod-based systems.” This inclusive term actually encompasses all flexible vertical members. These include stainless and galvanized steel cables, and single filament nylon cords used in place of cables. These nylon cords may be available in uncolored-transparent, and a variety of colored materials.

Cables vs. Rods

With all these advantages for cable-based systems, when should rods be specified over cables? Rods should be a primary choice for one or more reasons:

1. Strength – While the typical steel cable will bear ±45 lbs. in a hanging system application, an aluminum rod is rated for ±70 lbs.
2. Anti-theft - Rods are offered in configurations that are anti-theft. Cables typically are less capable in this regard.
3. Dynamic Displays - Because rods are rigid, they are very easy to maneuver. The user may add or remove them from the track by reaching any portion of the rod. To manipulate a cable, the user typically needs to nearly reach the track, which may require a ladder. As a result, rods are often preferred in applications where a display is frequently changing—it is a matter of convenience.
4. High-Mounted Track - Closely related to the last point, but slightly different, the last primary catalyst to specifying a rod-based system is in situations where the track is mounted higher than typical (10–13 feet from the adjacent floor). With a cable system the operator would certainly require a substantial ladder. Many insurance carriers, under Workman's Compensation coverage, forbid average (uncertified) employees from using ladders, so in this case, using a rod-based system is a convenience and likely offers indirect cost savings.

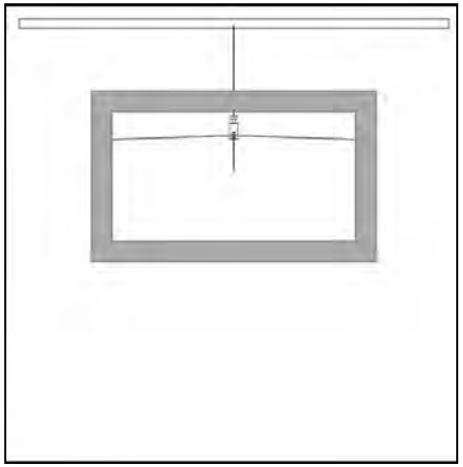
Selection Criteria - Cable-Based Hanging Systems

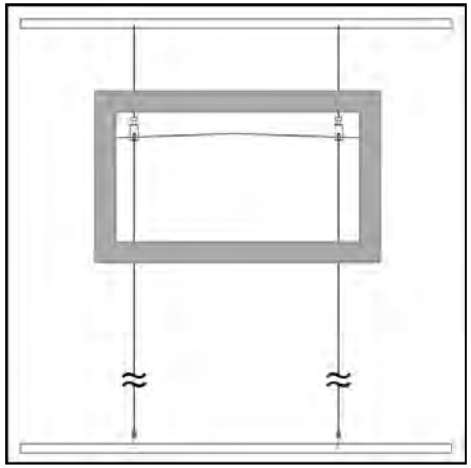
Suspended vs. Tensioned

All cable-based hanging systems may be categorized into one of two over-arching categories, “suspended” and “tensioned.”

A “suspended” cable system is by far the most popular and uses an above-mounted track to support the weight of the system. The cables hang down and terminate somewhere along the wall, usually behind a wall object.

A “tensioned” system relies on a pair of tracks, one above and one below the wall object. The cables, while still supported from the upper track, are attached and tensioned via a spring assembly to the lower track. Stand-off, or pier-based systems, are another instance of tensioned cable architecture.





Suspended: Track-Based

- Discreet
  - Cable terminates behind the lowest item
- No trimming of cable required
- Object preparation is important

When someone thinks of a “wall hanging system,” pictured to the right is the configuration most see in their mind’s eye. It may be made to look quite contemporary or quite traditional (as in the following slide). With but a single upper track, this configuration is least obtrusive to a space. Note that the cables terminate behind the art and how well they hang—square and flush to the wall.

To accomplish this level of finesse, attention should be paid to how the wall objects are prepared for display. This will be discussed later in this program.

Suspended: Track-Based

In this instance of a suspended cable system, the installation is very traditional and fitting with the style of the room. This has been accomplished by mounting a close-faced track in conjunction with period crown molding.

Tensioned: Track- or Stand-Off-Based

- Engineered in appearance

Tensioned cable systems all have an upper and lower point of attachment. These attachment points may be track-based or stand-off-based.

Because of the extra hardware fittings of a stand-off-based implementation, the appearance is more of an engineered look. Although not to the same extent, this is also true of track-based tensioned cable systems. The engineered look makes these a popular accessory in retail display and in many contemporary, industrial, and post-modern interior design schemes.

Tensioned: Track- or Stand-Off-Based

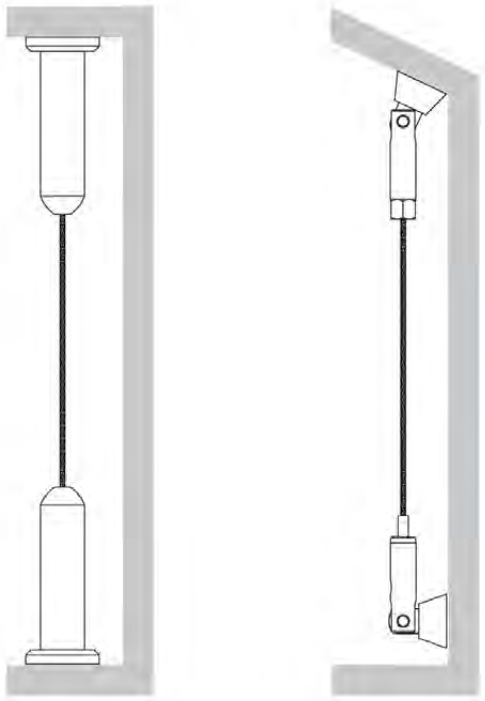
- Solution for avoiding movement
  - mid-wall objects within reach
  - earthquake & motion resistant
- Greater installation labor
- Often hangs objects with more finesse and less preparation

An additional benefit of tensioned systems is that the suspension system can absorb a certain amount of movement or vibration. This is handy when objects are otherwise displayed mid-wall or in traffic locations. The designer of the cruise ship *Crystal Symphony* solved an interesting challenge—hang art in a high traffic, transitional/gallery space, on a curved wall.

The solution had to protect the paneled walls from holes, yet allow for frequently changing displays of various sized pieces. Further, since this is a moving vessel subject to the pitch and yaw of the open seas, the system had to accommodate a vertical axis that might alternate by as much as ±10 degrees from vertical. Solution: a track-based tensioned cable system.

Stand-Off Systems

- Fixed Piers (Stand-Offs)
  - floor to ceiling or similar
- Articulated Piers (Stand-Offs)
  - floor, ceiling, wall, everything else



A variation on the tensioned cable system is one that uses stand-offs as opposed to an upper and lower track. Note: Some vendors refer to these as piers. There are two basic variations on the available hardware.

Fixed stand-offs must be mounted to two opposing and horizontal surfaces, such as a floor and ceiling, or a window upper return and ledge, etc. These are usually deployed in pairs and may support a wide variety of objects in an even wider variety of applications, from window merchandising, to visual space dividers, to directional signage, art, municipal announcements, café menus, directories, etc.

Articulated stand-offs are fabricated with an elbow. This hinge allows them to be mounted to ceilings and floors, but also to walls and any other available surface.

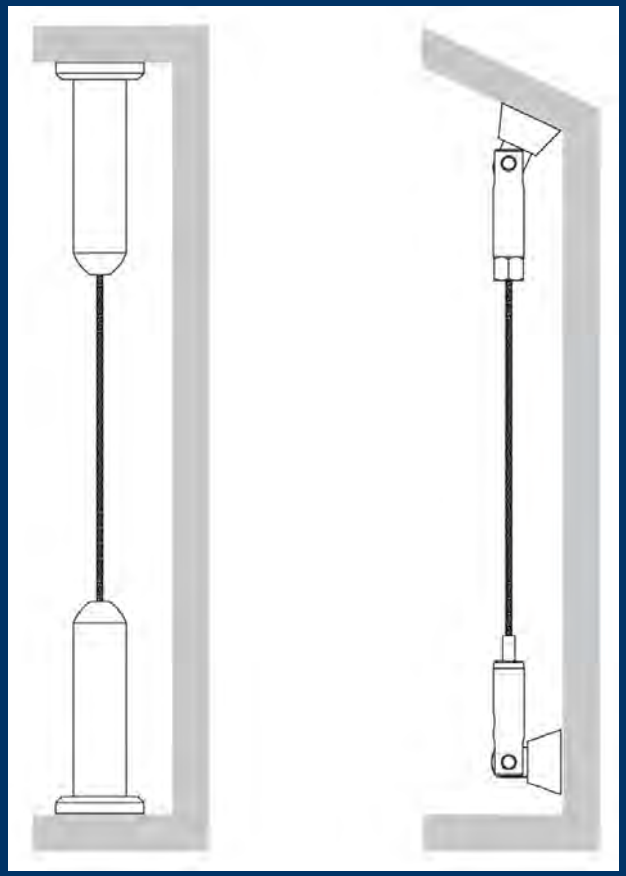
Stand-Off Systems

Consideration should be given to mounting stand-offs that will support any real weight, particularly when mounting to wall surfaces. Because the angular forces may exceed the crush strength of common gyp-board, it is preferred to mount such piers on rigid or even structural surfaces, particularly in commercial applications.

Other than these installation issues, a stand-off-based tensioned cable system may be used just as you would a track-based system.

REVIEW QUESTION

Identify and describe each of the systems depicted to the right.



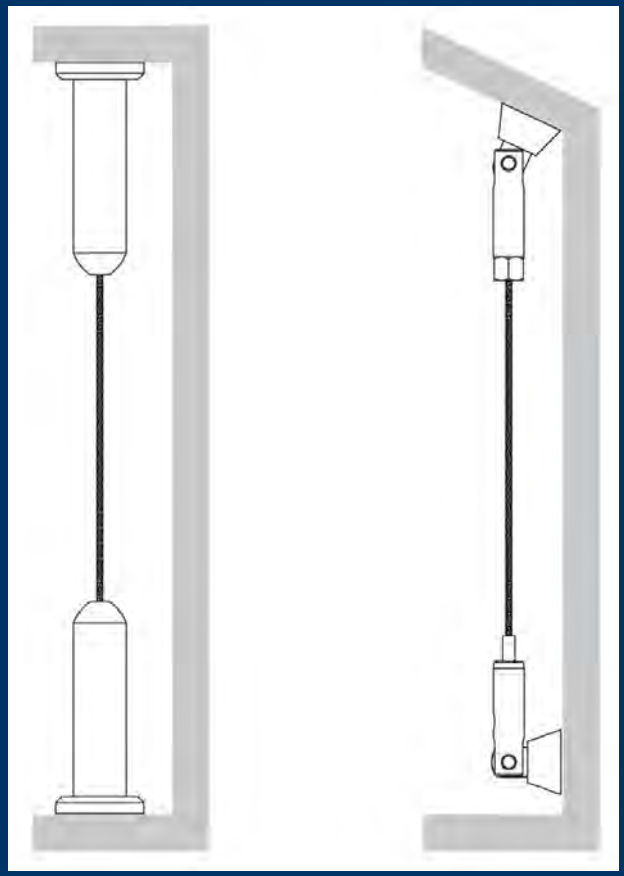
ANSWER

The left image is a fixed pier (stand-off).

Fixed stand-offs must be mounted to two opposing and horizontal surfaces, such as a floor and ceiling, or a window upper return and ledge, etc. These are usually deployed in pairs and may support a wide variety of objects in an even wider variety of applications.

The right image is an articulated pier (stand-off).

Articulated stand-offs are fabricated with an elbow. This hinge allows them to be mounted to ceilings and floors, but also to walls and any other available surface.

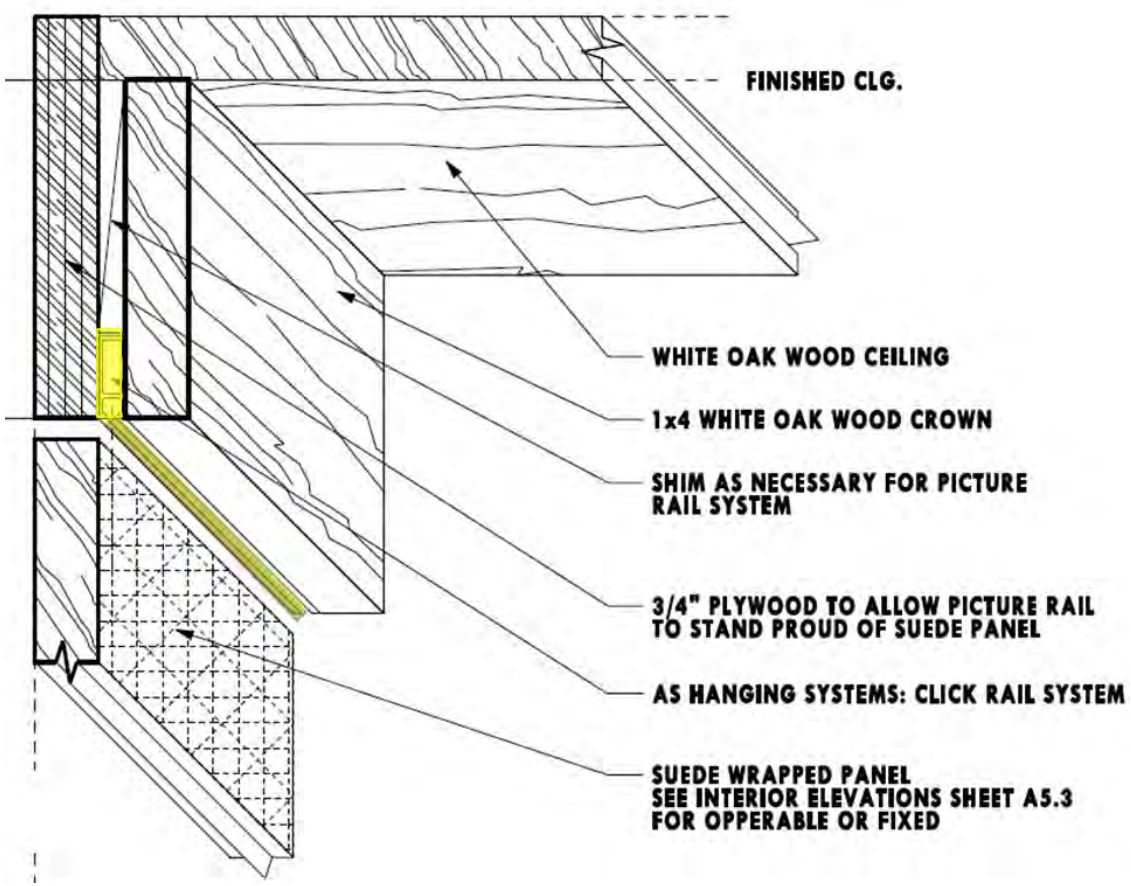


Interior Design Integration

Masking Track Location – Behind Carpentry

When anticipated and planned for, hanging system hardware can be made quite obscure and “designed into” a project. The strategy is to mask the track location. In this instance we are not talking of simply finishing the track to match the adjacent colors; we propose to mask the track behind finish carpentry.

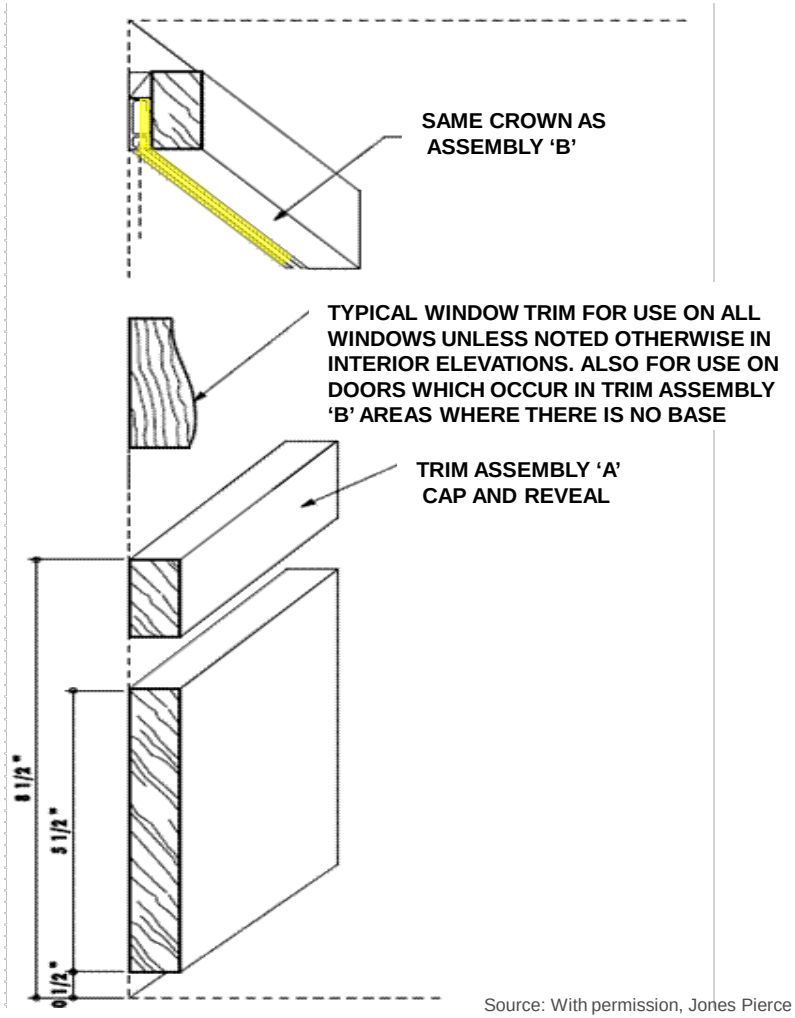
The drawing shows how an architect specified the track to be hidden behind a solid white oak cornice and adjacent matching ceiling. The hanging system protects suede wrapped panels below, from art hanging damage.



Source: With permission, Jones Pierce Architects, Atlanta, GA

Masking Track Location – Behind Carpentry

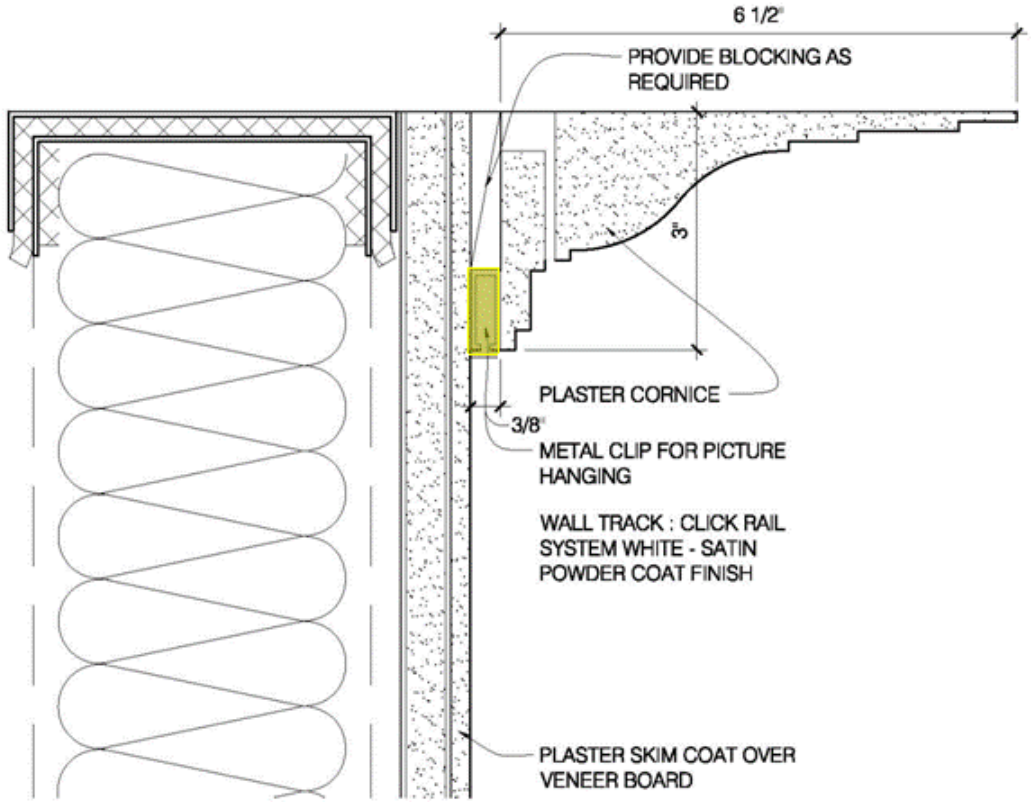
In this example the architect repeated a pattern of positive and negative lines, using clean angular casework at both the top and bottom of the wall. The hanging system track has been hidden behind an upper “crown.”



Source: With permission, Jones Pierce Architects, Atlanta, GA

Masking Track Location – Behind Carpentry

Where the two prior examples depicted this sleek track system behind contemporary casework, this illustration shows how the same “sleek track” may be hidden behind quite traditional plaster profiles to compliment a very traditional interior design.



A METAL CLIP IN PLASTER WALL
6" = 1'-0"

Source: With permission, Marvin Herman and Associates, Chicago, IL

Masking Track Location – Below Crown Molding

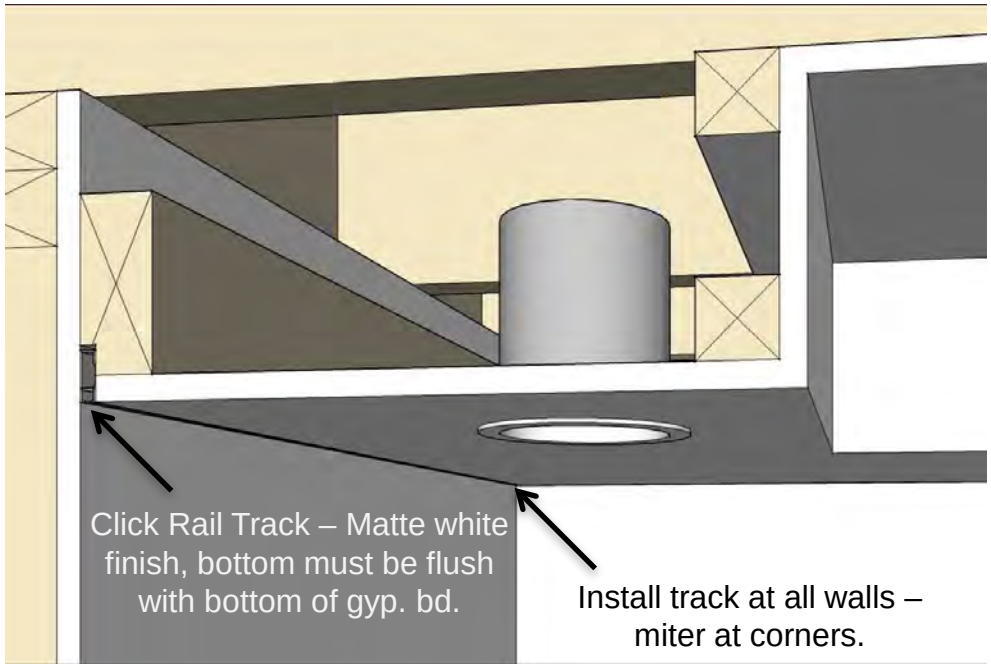
What do you do where there is a need for a hanging system in an already completed space, such as during a renovation, and where finished carpentry has already been installed? It is not possible to mask the track behind crown moldings in these instances.

This photo shows a close-faced wall track installed immediately below and adjacent to existing crown molding. It was then painted to match, and the eye “reads” the track as just another reveal in the molding profile. The track effectively disappears in the room. You will be able to detect the track by observing the far wall where it terminates at the window.

This room was completed with a traditional molding profile, but the same can be achieved with the clean lines of contemporary themes, and the effect is even easier to pull off. This photo shows a good example of why track is best applied to an entire room, or, at a minimum, an entire wall length; less attention is drawn to the track location.

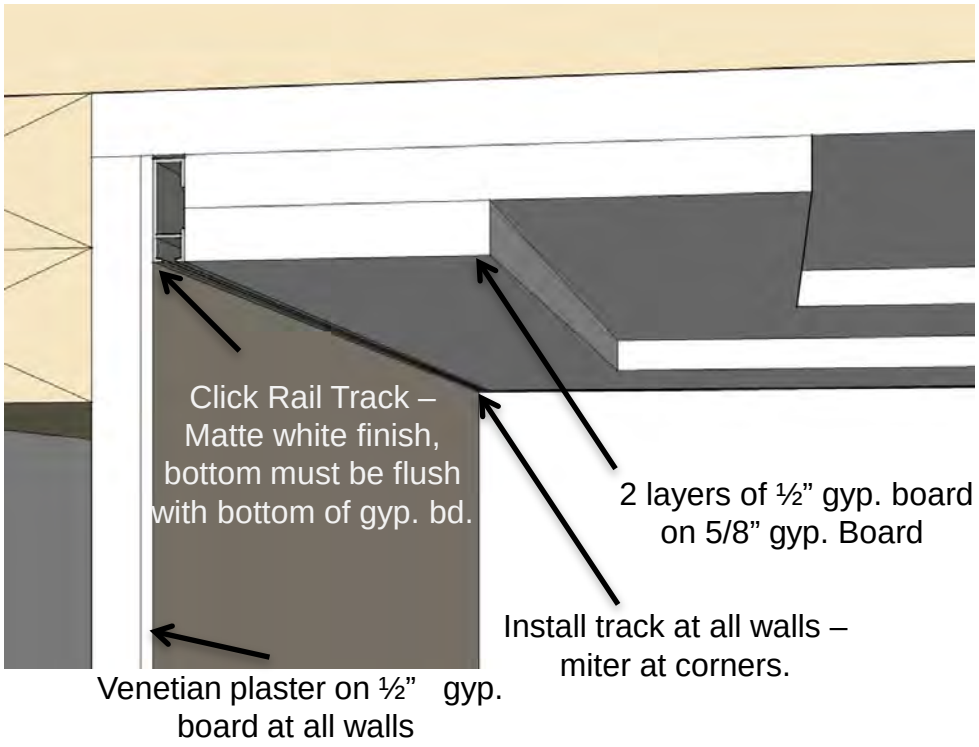
Masking Track Location – Soffit

Another way to hide a track is to integrate it into a soffit. This illustration shows one method of incorporating a close-faced wall track into the construction of a typical soffit.



Masking Track Location – Ceiling

Similarly, such a track could be masked in the wall/ceiling corner of a ceiling race-track gyp-board detail. A critical consideration for both this and the soffit application is that the hanging system track be of a design that allows the vertical member to interface with the bottom of the track.



Masking Track Location – Ceiling Alcove

The opposite is also a method for limiting the visual exposure of a wall track. This photo shows how an architect specified the track be mounted very high on the wall and in an “alcove” (negative soffit), well above the line of sight. It is barely visible in this photo in the upper right.

Wall Track Reveal

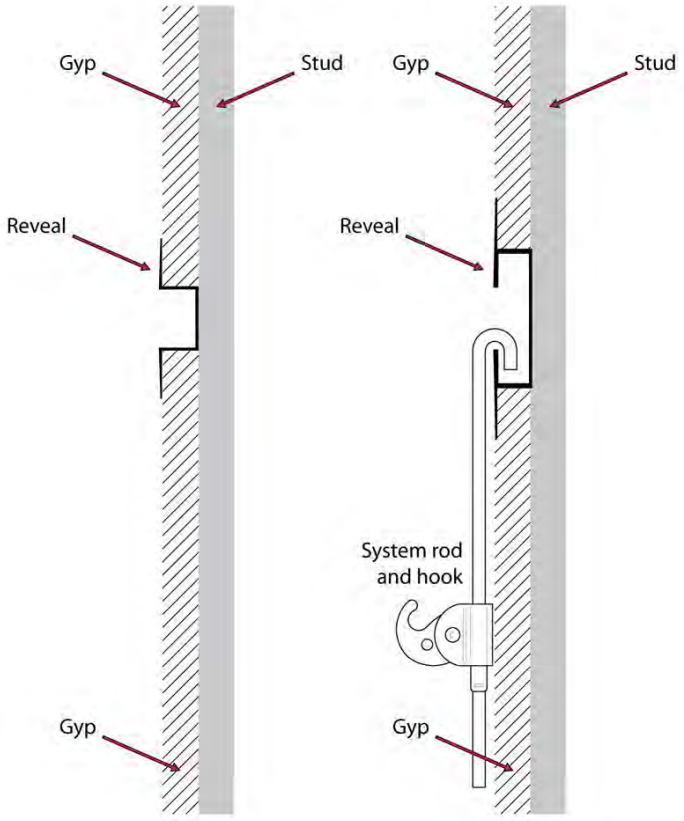
With considerable success, designers and architects have used open-faced track for a second purpose: as an architectural detail—a wall reveal. These photos show a community center that was enhanced with a reveal that also serves as the track for a hanging system. This reveal is constructed from a commonly available open-faced hanging system track.

Integration With Reveals

Compatibility

Common vs. Flanged Reveals

One of the most frequently overlooked opportunities for integrating hanging systems into construction techniques is in specifying hanging system fittings to be compatible with gyp-board wall reveals. Using a reveal as a track is a "green" approach to design. The reveal continues to serve its original purpose as a visual break and architectural detail; however, the reveal may also serve as the track from which system fittings can be mounted. There are three major suppliers of such reveals: Fry Reglet, Gordon Interior Specialties Division, and Pittcon Industries.
To accomplish compatibility, it is imperative that the common "generic" reveal not be selected. To be compatible, a reveal must have a flange (lip) from which a hanging system rod or cable may hang.



Common reveal without flanges and a compatible reveal with a P-End hanging system rod placed on the flange ready to suspend a wall object.

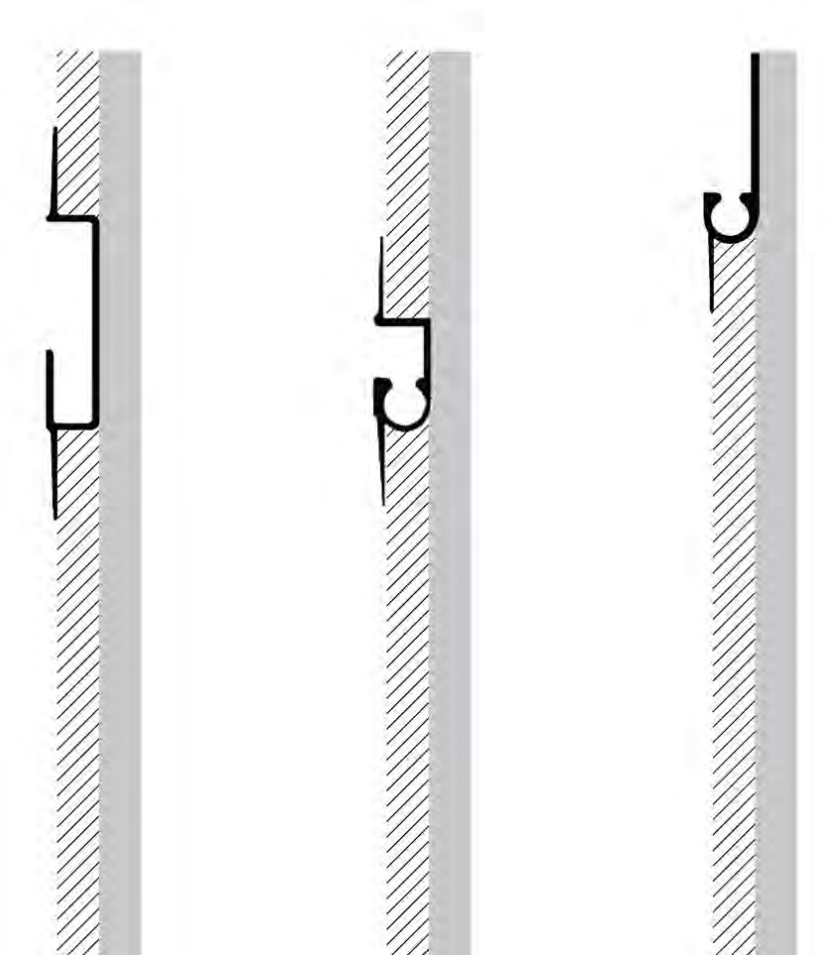
P-End Cables / Rods & Reveals

Fry Reglet Contemporary Reveal Molding (CDRM) is available in a wide variety of sizes for 1/2” and 5/8” gypsum board. The reveal is recognized by its symmetry at both the top and bottom lips. During installation, both are filled with drywall compound.

Gordon Interior Specialties Division produces this profile of reveal, series 942. It differs from the earlier Fry Reglet profile in that only one side of the opening offers a lip from which hardware may be suspended. The entire lip acts as a screed, leaving the lip exposed as a finished metal detail. This can be a nice detail, while others may prefer the mud-filled flange as proposed by Fry Reglet.

P-End Cables / Rods & Reveals

Pittcon Industries, under the Softforms® brand, offers three compatible reveals in their “Hanging Track” series. The first, SWR-050-HT, is very similar to the offering from Gordon. The second, SWR-118-HT, is a smaller profile with a more substantial lower lip, but still recessed into a wall faced with gyp-board. The third profile, STR-063-HT, is unique in that it is to be deployed at the top of the wall, creating a visual reveal just below the ceiling. Please check with your hanging system and reveal vendor for compatibility and weight limitations.



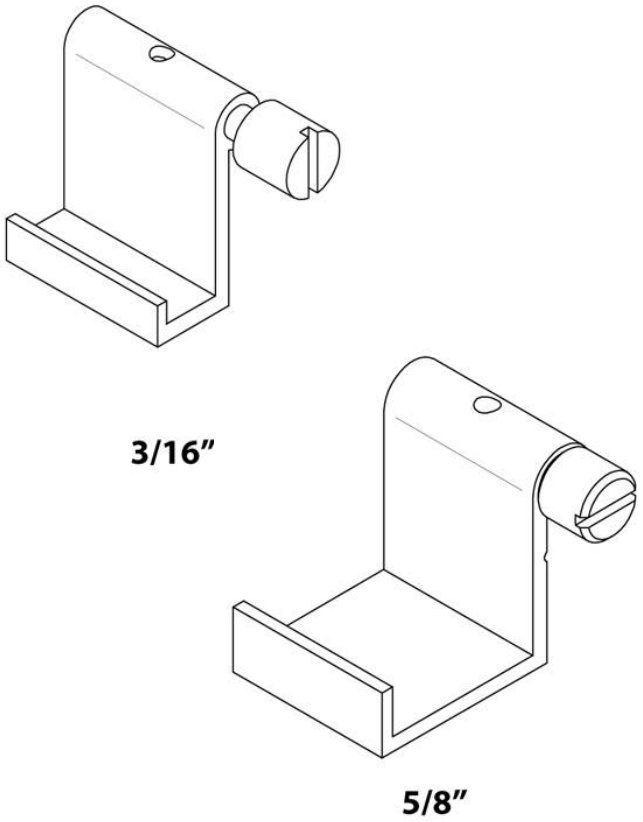
Special Purpose Fittings

Utility Hooks

There are many specialty hooks and fittings available that will serve your designs particularly well. They add to your creative and problem solving palette. We will explore a couple of these special hook designs to “pre-load your palette.”

The “Utility Hook” is available in two sizes; the smaller will accept 3/16-inch material and the larger, 5/8-inch.

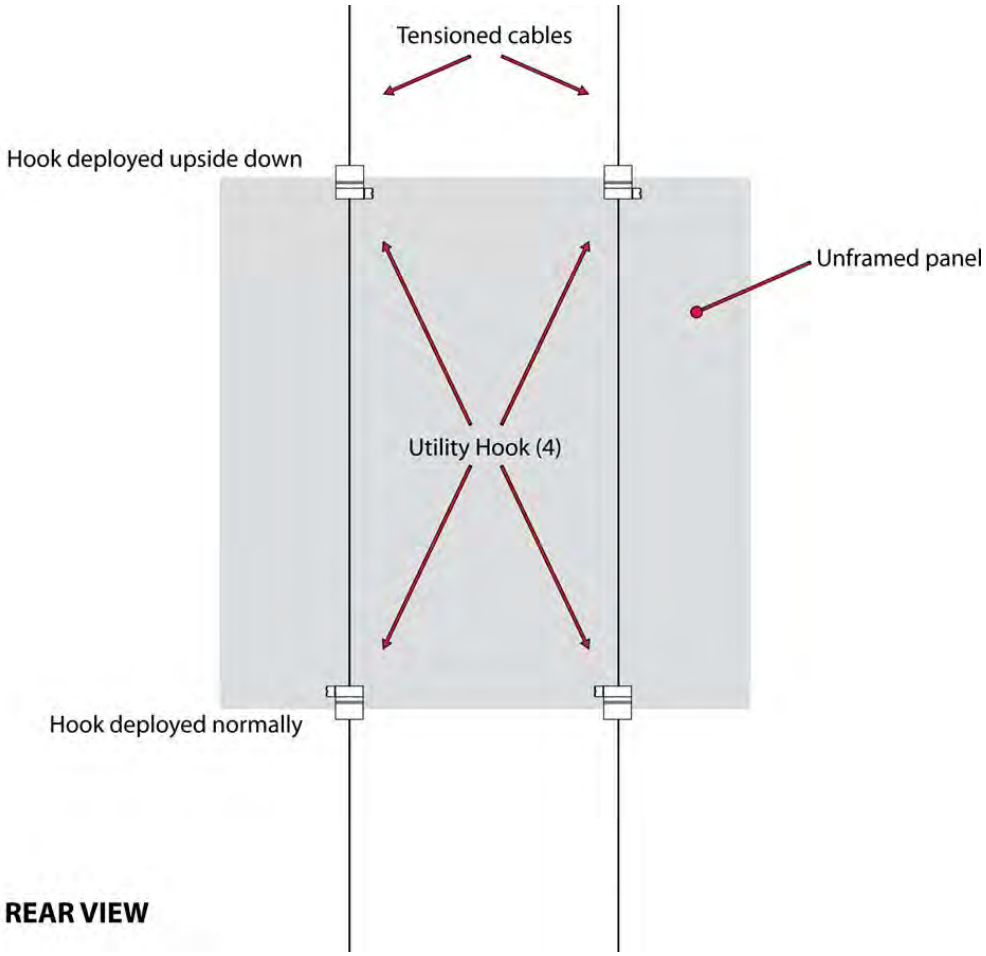
Less than obvious is how effective these are in hanging unframed panels such as acrylic panels, foam core, Masonite, Sintra, new honeycomb panel substrates, and other similar materials, and how great for “pitch” rooms at creative agencies.



Utility Hooks

These various substrate panels are very popular for signage and as a base upon which photographic prints and posters are surface-mounted. In these applications it is common for these panels to be unframed. This attribute can make these panels otherwise difficult to wall mount.

This illustration shows how such tasks are made easy with four utility hooks and a tensioned cable system. The upper two are fed onto the cables in an upside-down orientation. From the front the hooks are difficult to detect.

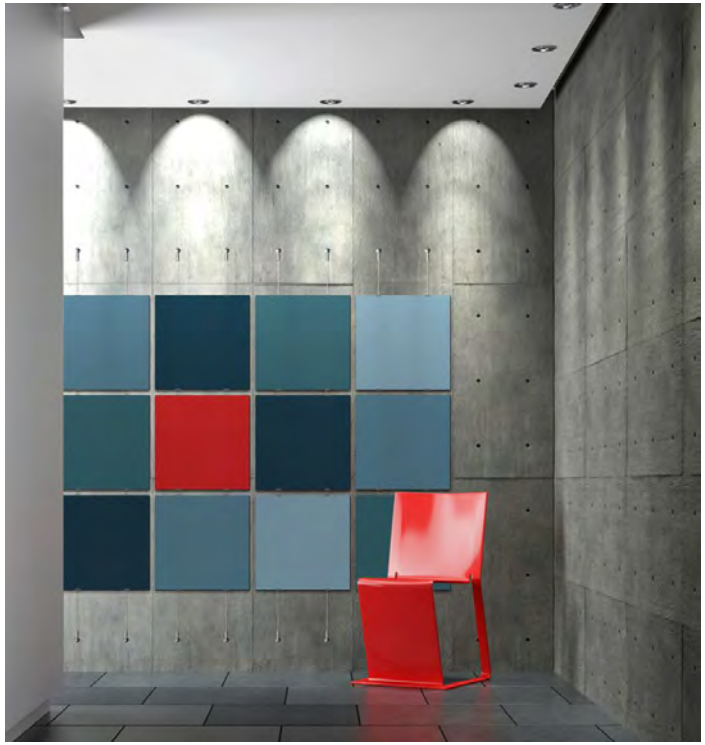


Utility Hooks

This photo shows the described solution as recently used in the Green*life*™ Pavilion at a recent NeoCon® Expo. The hardware does recede into the background, and the walls are left undamaged. But perhaps the best attribute of this approach is that the panels may be changed without tools and nearly effortlessly. The top hooks don't even require tightening. Objects simply need be lifted out of the channel created by the lower hooks. This combination of attributes makes the utility hook a great improvement/replacement for the industry standard "pitch rail" found in conference rooms of ad agencies, product designers, architect and designer offices, etc. It overcomes a major shortcoming of the "pitch rail": no longer will presentation boards fall to the floor simply caused by air movement when someone walks by. This approach to "pitch wall" creation does not require a deep, mid-wall-mounted molding that consumes space. A "pitch wall" constructed from hanging system components requires almost no space.

Utility Hooks

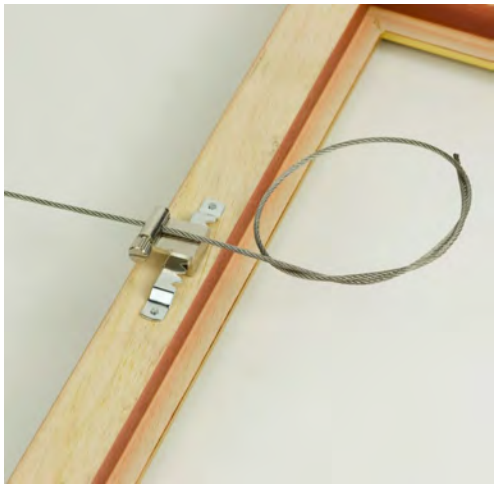
The image to the right displays another variation on the use of this specialty hook to support panels. As long as you are involved with designing the building and its interior, you may use this hook to design the wall decorations as well. Colored panels, individual photo elements, and photographs spanning multiple panels are just a few examples—let your imagination go.



Utility Hooks

A utility hook certainly possesses “utility.” There is another common wall object that is often difficult to hang with common hanging system hardware: award plaques routed with a slot on the rear side. The smaller utility hook does a very good job of interfacing with this slot.

Lastly, this versatile hook is also very purposeful when attempting to hang objects prepared on the rear with a sawtooth hanger. Just as with the plaque application, objects prepared with sawtooth hangers are frequently smaller objects. The utility hook is appropriate for this application because you will want to minimize the gap behind the object, particularly on small objects; the utility hook does that while also providing a stable platform for the hanger to rest upon.

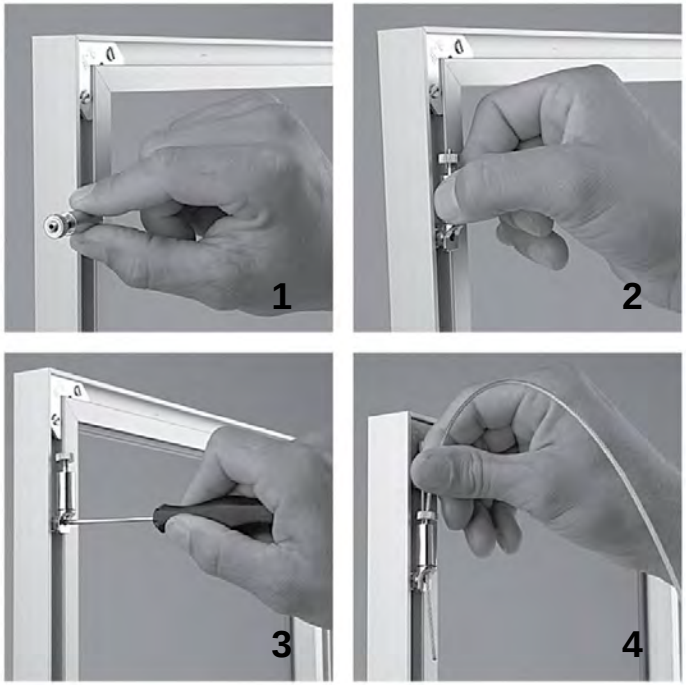


Aluminum Frame Hooks

Another specialty hook that is worth investigating is the “Aluminum Frame Hook.” This patented product is unique in that it interfaces directly with the rear channel of many leading brands of extruded aluminum picture frames. This photo shows one such hook installed in this manner. They are installed in pairs, one for each side of the frame. Please note the cable stop that has been applied to provide anti-theft capability.

Aluminum Frame Hooks

These hooks are used in pairs, one in each side-rail of a compatible aluminum frame. They are held in place via a set screw and are installed to the frame first, and then to the vertical system cable. They produce a “secure” solution because of this design, but when used with a cable stop, as pictured on the prior slide, these hooks also offer anti-theft capability.

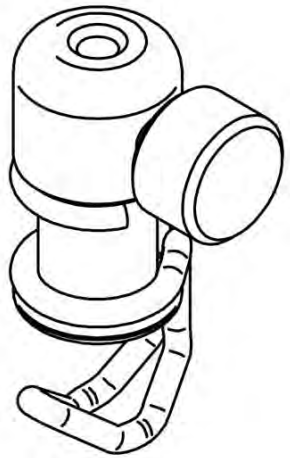


Since this type of frame construction is relatively inexpensive and robust, it is an excellent way to display student art at the high school, higher education levels, and at public libraries and other public facilities.

A series of mat boards can act as “adapters” to fit various sizes of art into a set of larger frames, so an extremely versatile and secure display system may be engineered for public display. When matched with these hooks, most malicious behavior can be avoided. This technique may be used on either suspended or tensioned cables, and when used with the latter, the solution is the most tamper resistant.

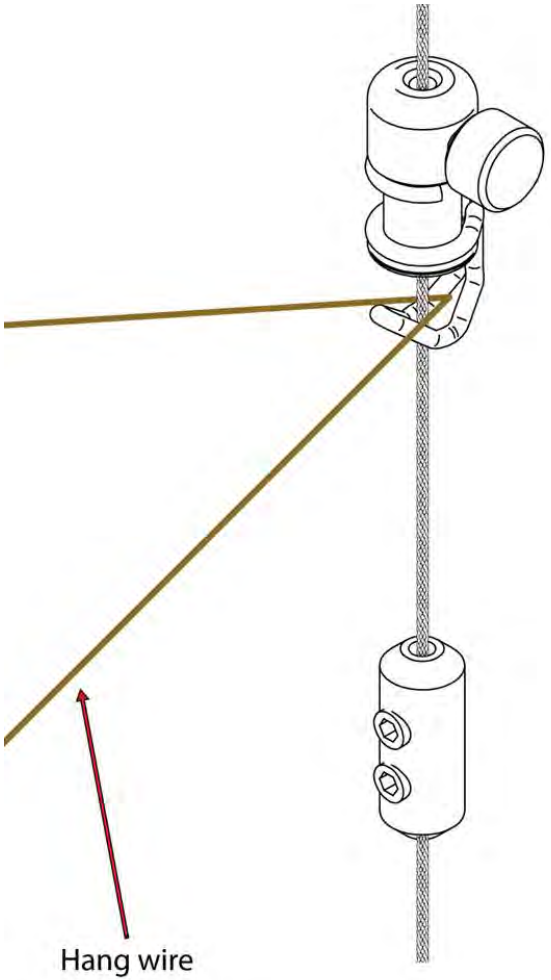
Mini Hook

Another specialty hook is the design pictured here—the “Mini Hook.” It will grasp common framed items that are prepared on the rear side with a hang wire, for example, but most any hook should offer that capability. It is also very small and will cause the smallest of gaps behind a frame. It features a swivel body so that it may be used in a left-handed or right-handed orientation, which is particularly good when hanging objects in tight quarters.

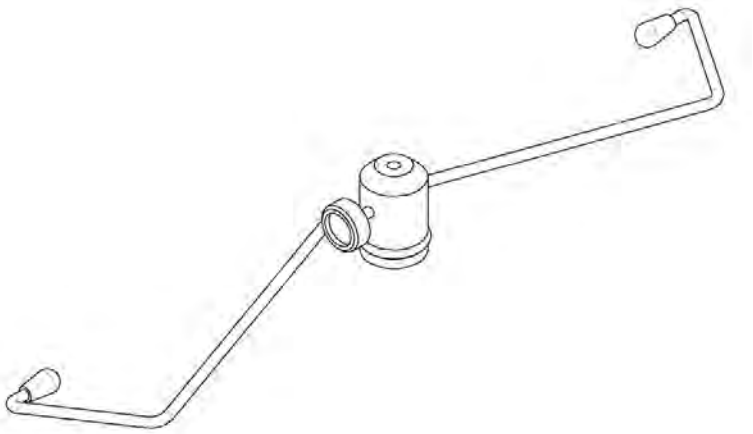


Mini Hook

But perhaps the less obvious attribute is that this design can also yield “security,” and, when used with a cable stop, as shown, and an appropriate cable/track combination, become anti-theft as well. This is accomplished, as shown in the illustration, by trapping the hang wire in the rear of the throat of the hook as the hook and framed object are jointly presented to the vertical system cable. The cable stop is applied later.



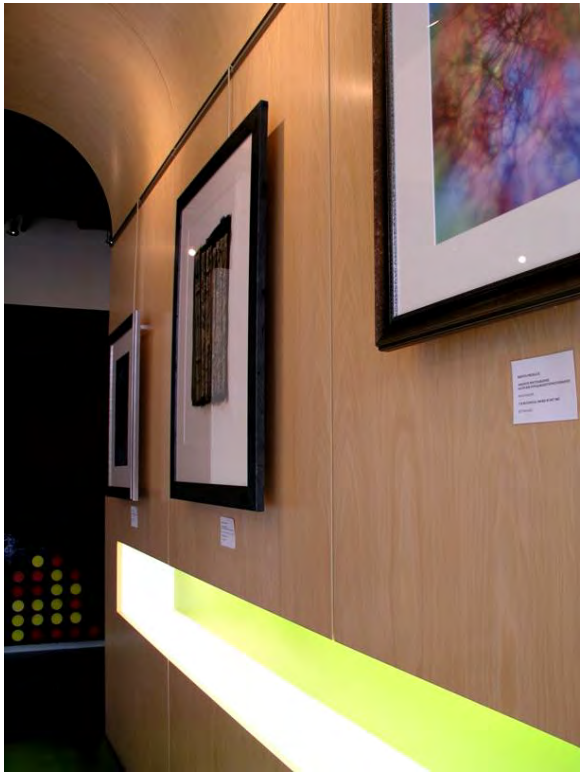
Frame Stabilizer



A particularly handy “fitting” is the frame stabilizer. These are available in models compatible with either cables or rods, and they offer two main benefits. First, some frames, because of the way they are prepared on the back side, will hang with the top slanting away from the wall. This situation can be mitigated with a frame stabilizer which brings the lower edge of the frame away from the wall in a similar manner. The result is the pleasing appearance of a framed object that floats on the wall. The second situation corrected by a frame stabilizer occurs when a vertical group of two or more objects is hung from one common vertical member. In this situation, all but the lowest item will hang in a manner where only one lower corner of the frame will contact the wall; the opposite corner will “teeter-totter” away from the wall. The stabilizer will equalize both lower corners in a uniform manner.

Frame Stabilizer

A frame stabilizer is mounted on the system cable or rod and placed at a level behind the lower rail of the frame. The result, as shown in these photos from an installation at the *aloft* Hotel in Minneapolis, MN, are frames that present very consistently, floating from the wall.



Weight Capacity

Considerations

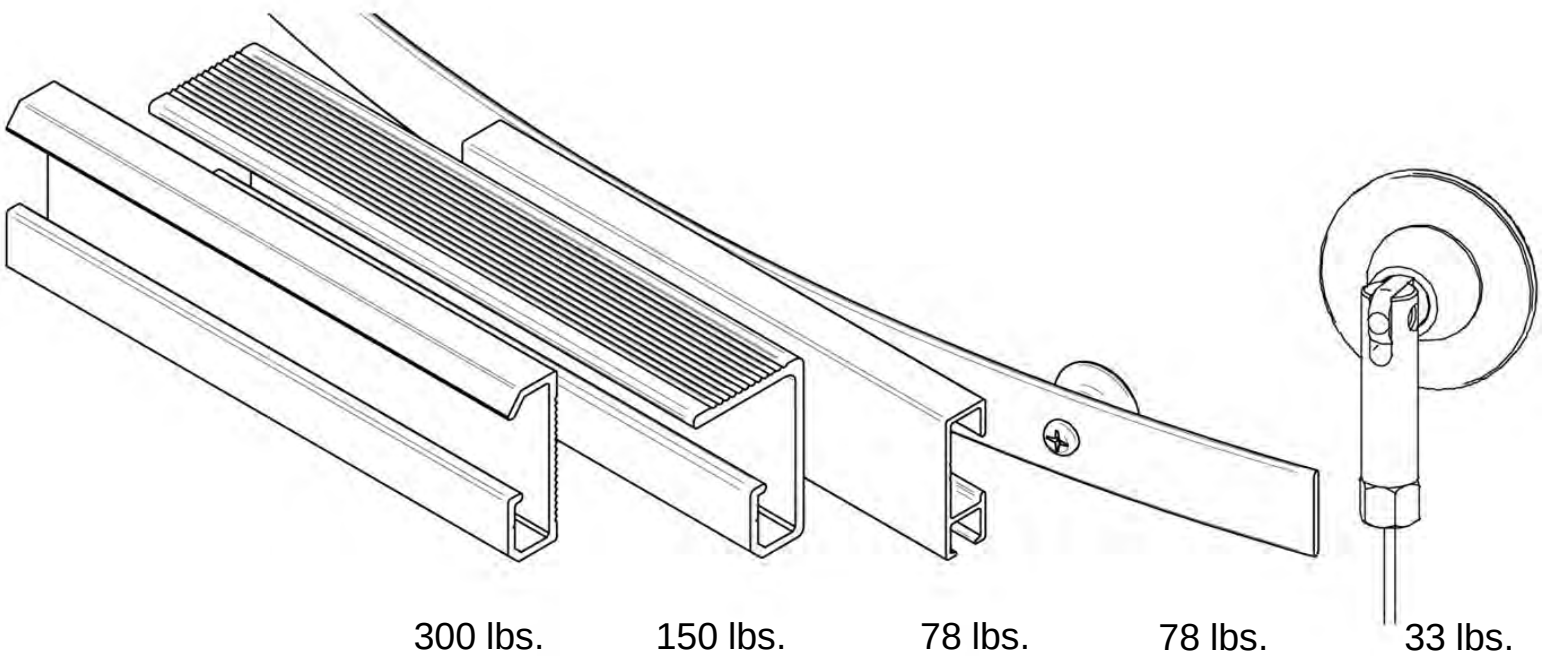
There are not yet industry standards (CSI, ANSI, etc.) for “hanging systems.” See the manufacturer’s published guides regarding weight capacity and installation. Steer clear of vendors that do not publish specific guidelines.

Be aware that each individual element (track, cable, rod, and hook) offers specific weight capacities. It is not possible to publish one umbrella capacity for an overall system. The weight capacity of any one installation is only as strong as the weakest component in that configuration.

Most hanging systems do not require that the track be attached to structural wall members to achieve a published weight capacity. However, in most residential applications, the track is mounted at the ceiling/wall intersection where the wall header is available to fasteners; this creates a safety cushion.

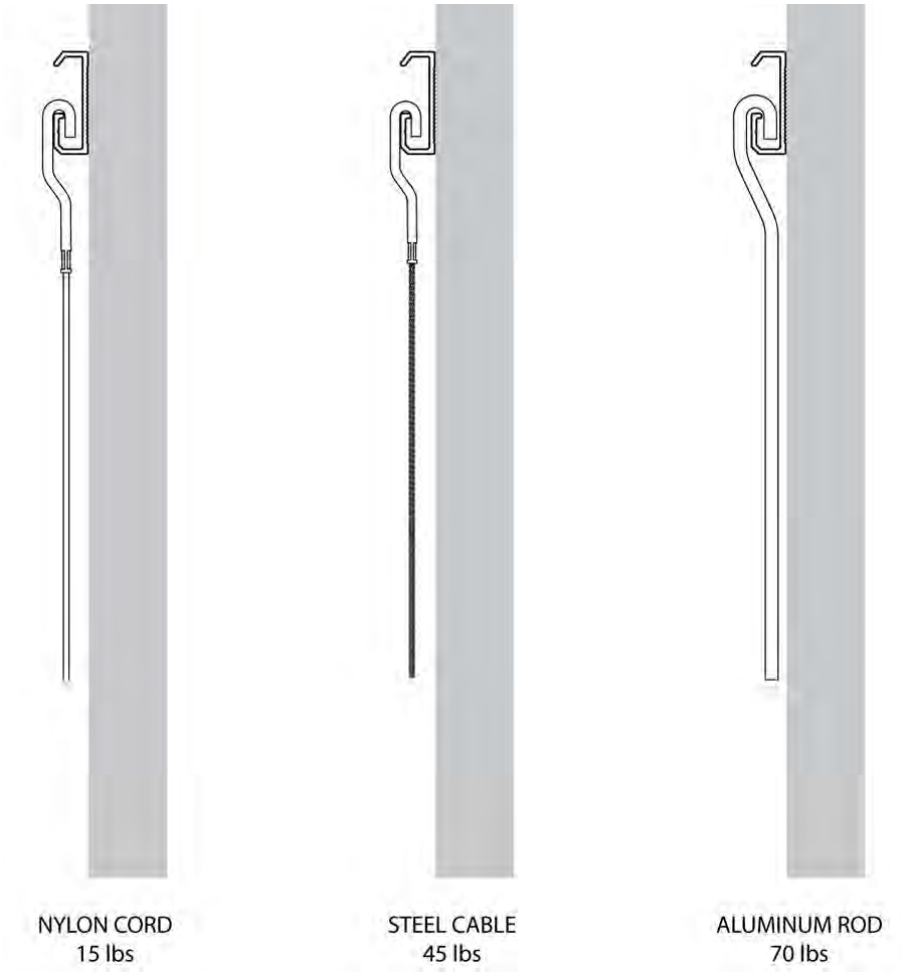
Tracks

Using one leading vendor's published specifications, you can see the four variations of track range in weight capacity from 78–300 lbs. The pier-based solution, when used against a structural surface or in conjunction with a large diameter weight-bearing washer (as shown), also supports 33 lbs. All track capacities are rated for each length of track, or portion, thereof.



Vertical Members

Irrespective of the track, each vertical member also has a capacity limit. As you see in this illustration, these capacities range from 15–70 lbs. for nylon cord, steel cable, and aluminum rod. Since this track offers 300-lb. capacity per track length, each track may support numerous vertical elements and remain within the published weight capacity.



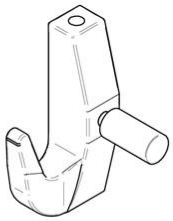
Hooks

Likewise, each hook offers a specific and limited capacity. This illustration lists the hooks offered by one leading vendor and the weight-bearing capacity of each. These range from as little as 2.5 lbs. up to 33 lbs. among the “cable hooks.” The rod hook is rated for up to 70 lbs.

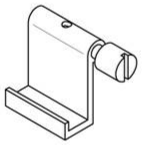
It is important to note that while more than one hook may be deployed on a single cable, it is possible to overload a 45-lb. capacity cable with as few as two fully loaded 33-lb. capacity hooks. In this case, the cable is the limiting factor, not the hook.

2.5 lb

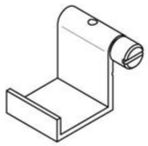
12 lb



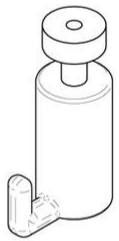
15 lb



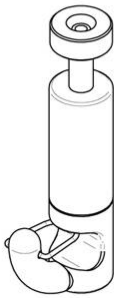
22 lb



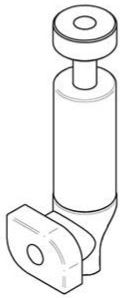
22 lb



33 lb



33 lb



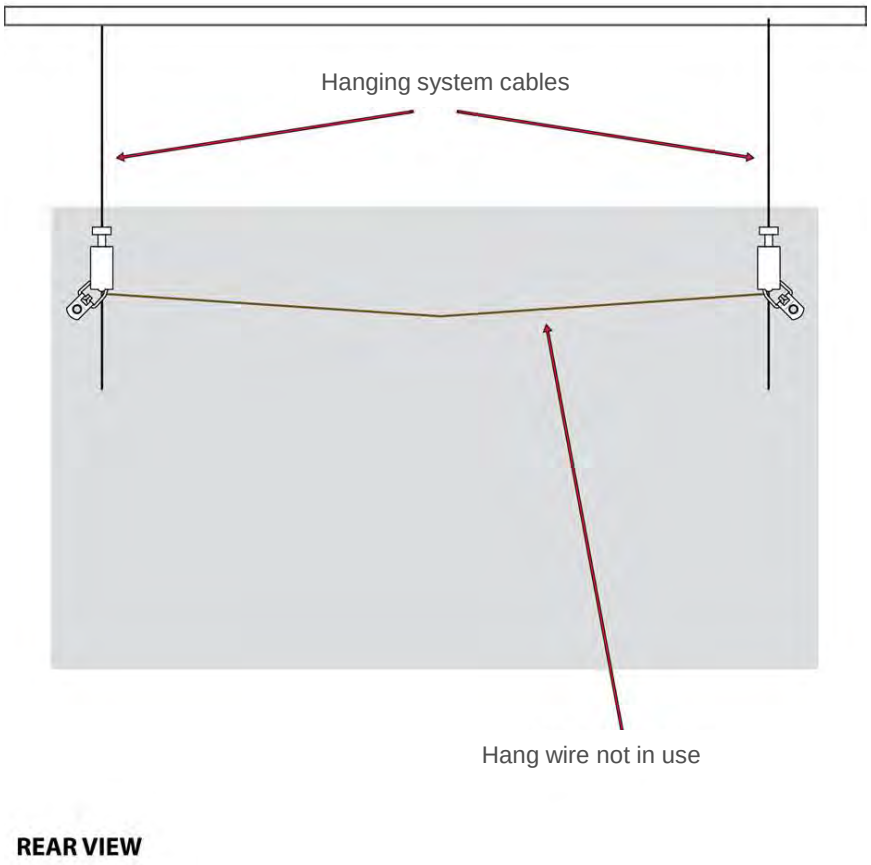
33 lb

70 lb

Common Implementation Questions

Can I use two cables/rods to support one object?

Yes, in addition to hanging an object from one vertical member (cable/rod), you may use two cables/rods to support a single object. These would run to the rear left and right sides of the object. It is recommended that any object wider than 24 inches would be supported in this manner. This adds stability to larger objects. However, if the object is a frame that is prepared on the rear with a hang wire, the two hanging system cables/rods should not attach to the hang wire, but instead, to the attachment points where the hang wire is attached.

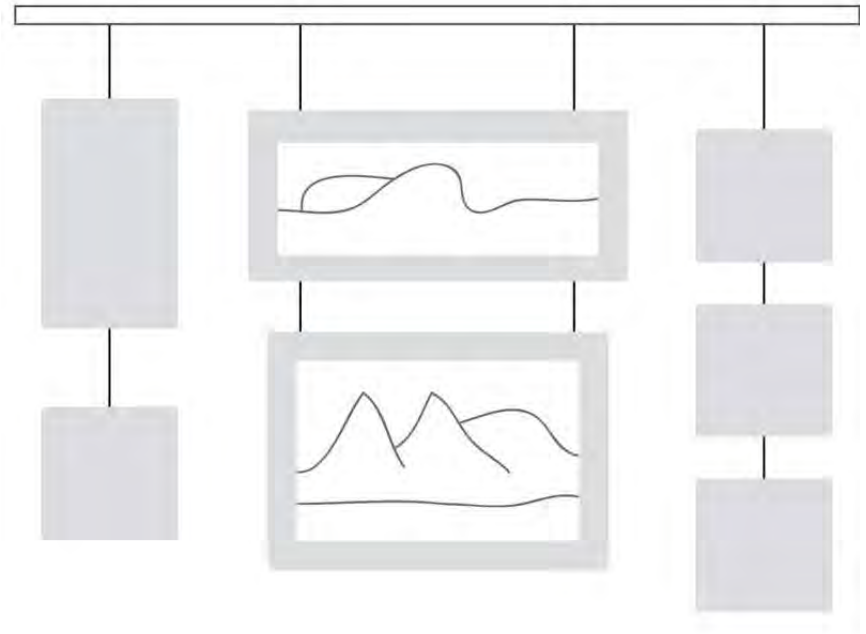


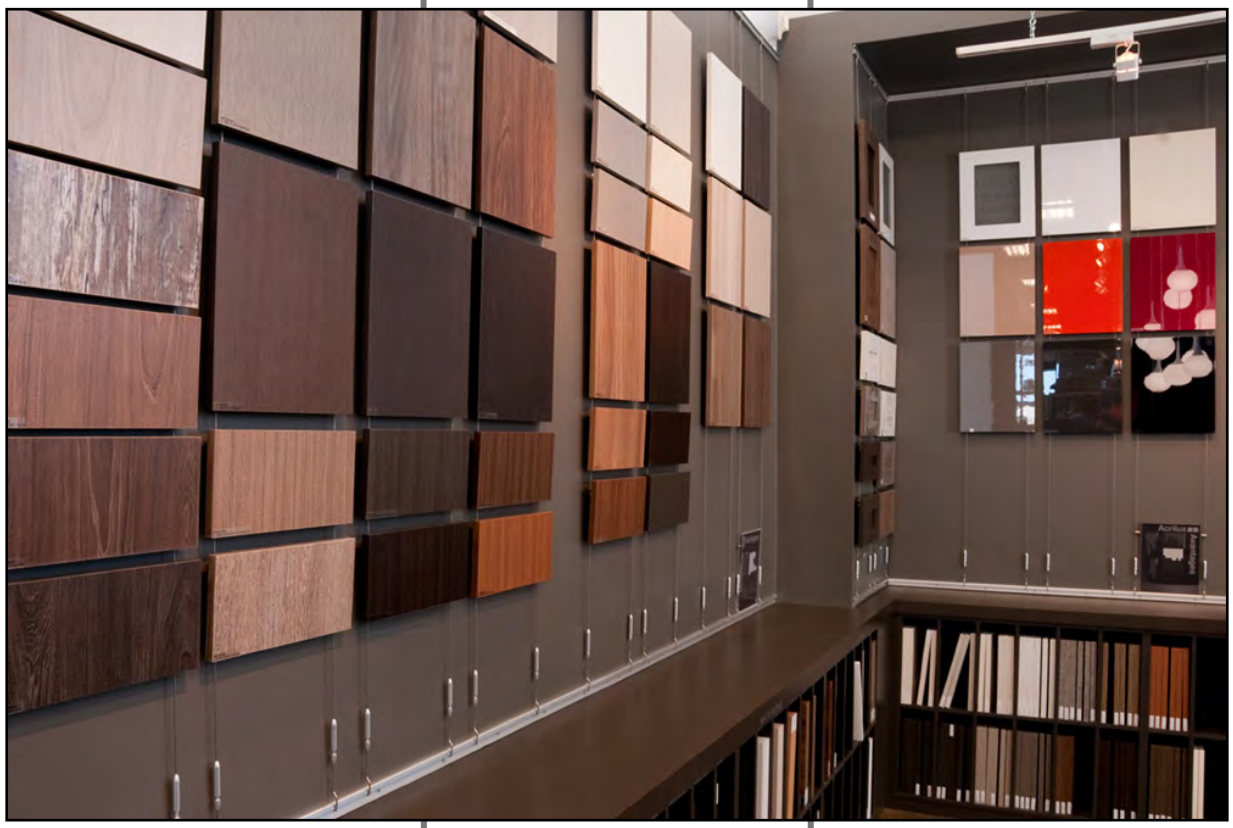
Common Implementation Questions

A second reason for switching from one to two cables/rods is to gain more weight capacity than either one hook or cable/rod might offer. Each component has a specific weight capacity.

Can I hang multiple objects from one (or more) cables/rods?

Yes, as long as you do not exceed the weight capacity of any individual component, you may add any number of items to a single, or a pair of cables/rods.



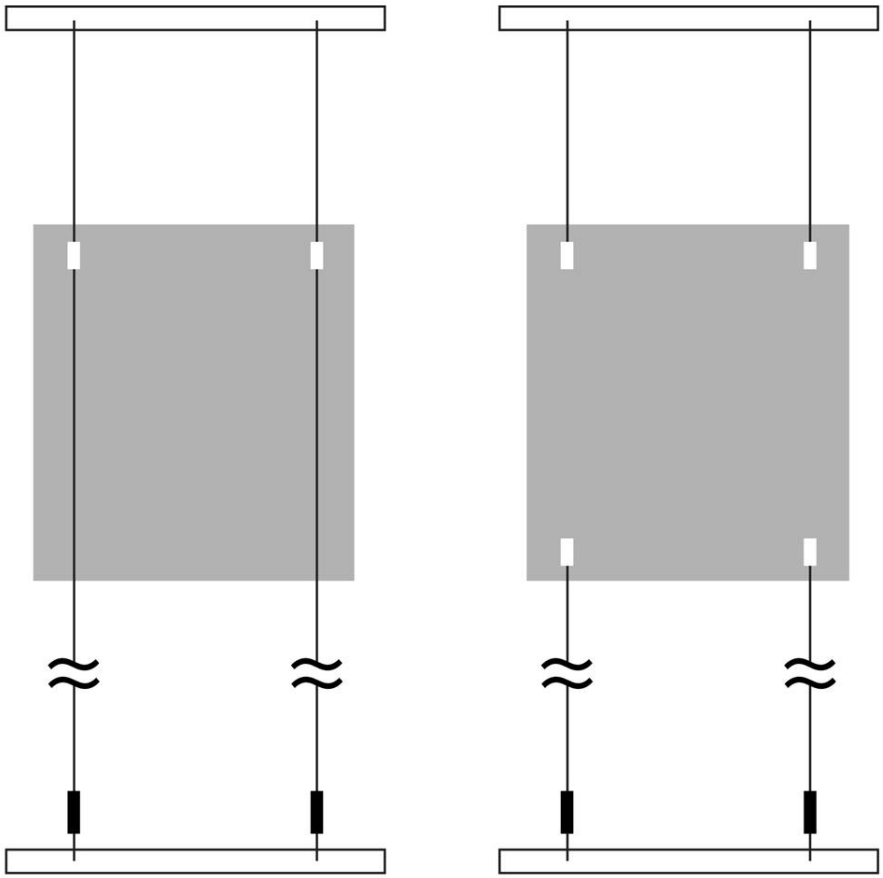


Specialty Applications

Seismic Zones

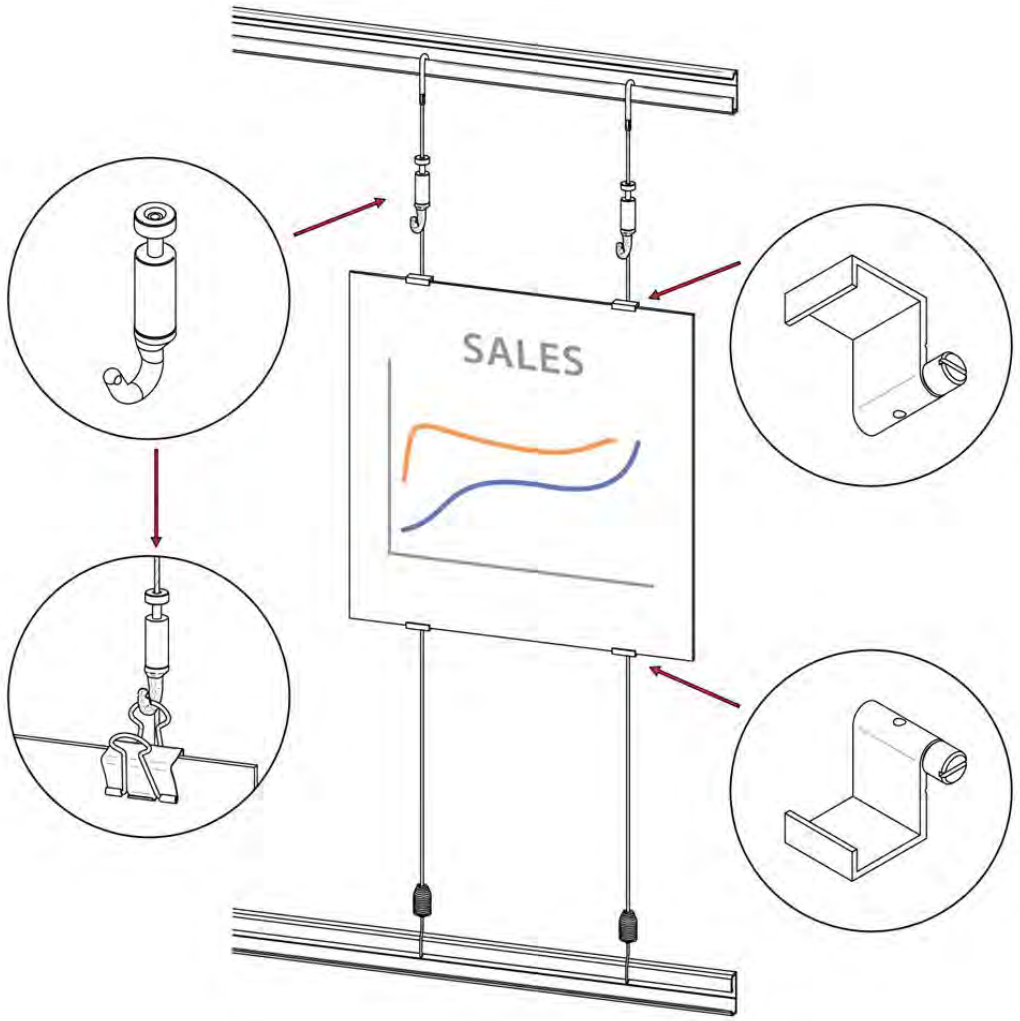
Hanging systems, as mentioned earlier, may be used to counter the effects of earthquakes on hanging items. The image on the left depicts the back side of a conventional tensioned cable set-up. In this instance, the framed object is free-hanging from the tensioned cables. The cables absorb most of the vibration and energy. The object is retained via security hooks.

The second illustration depicts a configuration where the tension runs through the frame itself. Either solution will work, and the selection will depend on the length of the cables, weight of the object, and preference for installation ease.



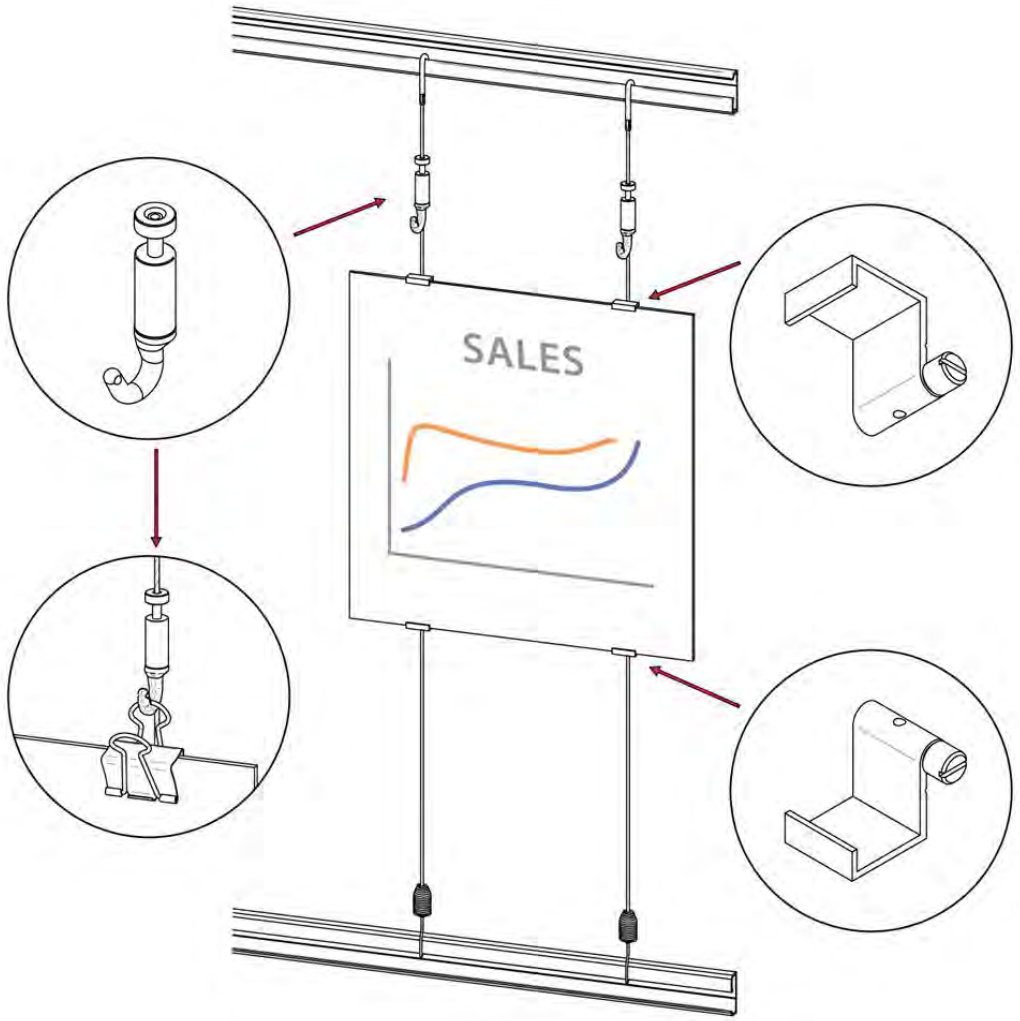
Wall-Mounted Easel

One vendor has preconfigured hanging system components to create a wall-mounted easel. It is a creative solution that mitigates the weaknesses of most common office space easels used for presentations and meetings. This easel occupies zero square feet of precious meeting room space and never has to be tucked into a closet or storage room where it can be damaged or damage other items.



Wall-Mounted Easel

This system is composed of tensioned cable using an upper and lower track, allowing the easel to expand or shrink on the horizontal axis. Four utility hooks hold a presentation board, and above these are two larger, self-gripping hooks that may easily hold a common easel pad. Lastly, to support velum, drawing sheets, or wide-format cad prints, etc., readily available binder clips are added to the self-gripping hooks. The track may be lengthened and additional cable sets added, making this solution expandable and adaptable to meeting rooms and “white collar” office spaces.

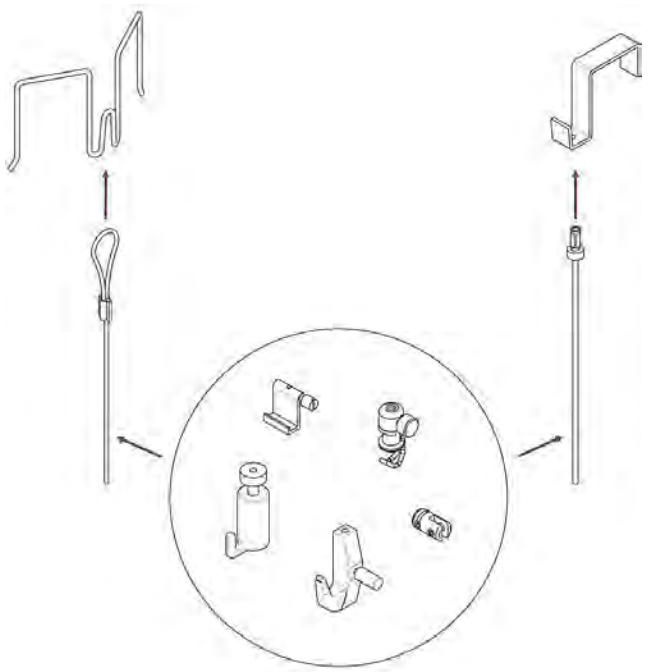


Cabinetry or Millwork

In this cabinetry application a close-faced track was installed just below the upper cabinet level. This allows the user to hang art, photos, or cork/white boards without damaging the furniture surface. One of the primary value propositions, protecting walls, is applicable to cabinetry as well.

Open Office Panel Systems: Hanging

There is another type of wall very frequently found in corporate and white collar spaces that also makes the task of hanging wall objects very difficult: panel system walls. Because these panels/partitions offer virtually no rigid support on the panel faces, conventional approaches to hanging are not possible.



Hanging system vendors offer solutions to this challenge as well. This illustration shows two commonly available approaches from a leading supplier. The left is a panel top hanger that, via spring action, adapts to various panel thicknesses

The right depicts a panel top adapter that also hangs over a panel of suitable depth. Each hanger may be mated with an appropriate cable and then a full library of hooks. The result is a convenient way to hang personal effects, white boards, bulletin boards, calendars, safety and motivational posters, employee notices, art, etc. from office partitions—without damaging the panels.

Update Functionality for Vintage Picture Rail

To this day, many buildings still retain their original picture rails. These may be adapted to recent technology—cables and hooks. With the use of a picture rail hook, which is commonly available, a loop-end cable or cord may be suspended, and in turn, any of the variety of available hooks.

The cable may be covered with a gathered-fabric sleeve, and the finished appearance is as it would have been during the Victorian era, however, with the functionality and reliability of modern hardware.

Brag Walls

"Brag walls," be they for architects, designers, ad agencies, graphic artists, photographers, realtors, etc. are well handled by particular configurations of hanging system hardware. These need to be versatile. A combination of utility hooks mounted to tensioned cables, hung from either tracks or piers, allows you the freedom to design as you wish with any size, aspect ratio, and number of panels.

Alternately, you can use acrylic sleeves, typically available in 8 1/2 x 11 and 11 x 17 in., landscape or portrait orientation. These sleeves are top loading like a manila folder and allow the user to insert and remove content with ease. Just think of the power such a system could have in the welcome area of an ad agency. When a prospective new client is visiting, the system could be pre-loaded with prior work from the prospect's industry.

Menu Boards

Another often overlooked use of such pockets systems is in creating menu boards for cafes, restaurants, and other food service establishments. The main benefit is that new content may easily be pulled or replaced in moments.

Please remember the **exam password HANGING**. You will be required to enter it in order to proceed with the online examination.

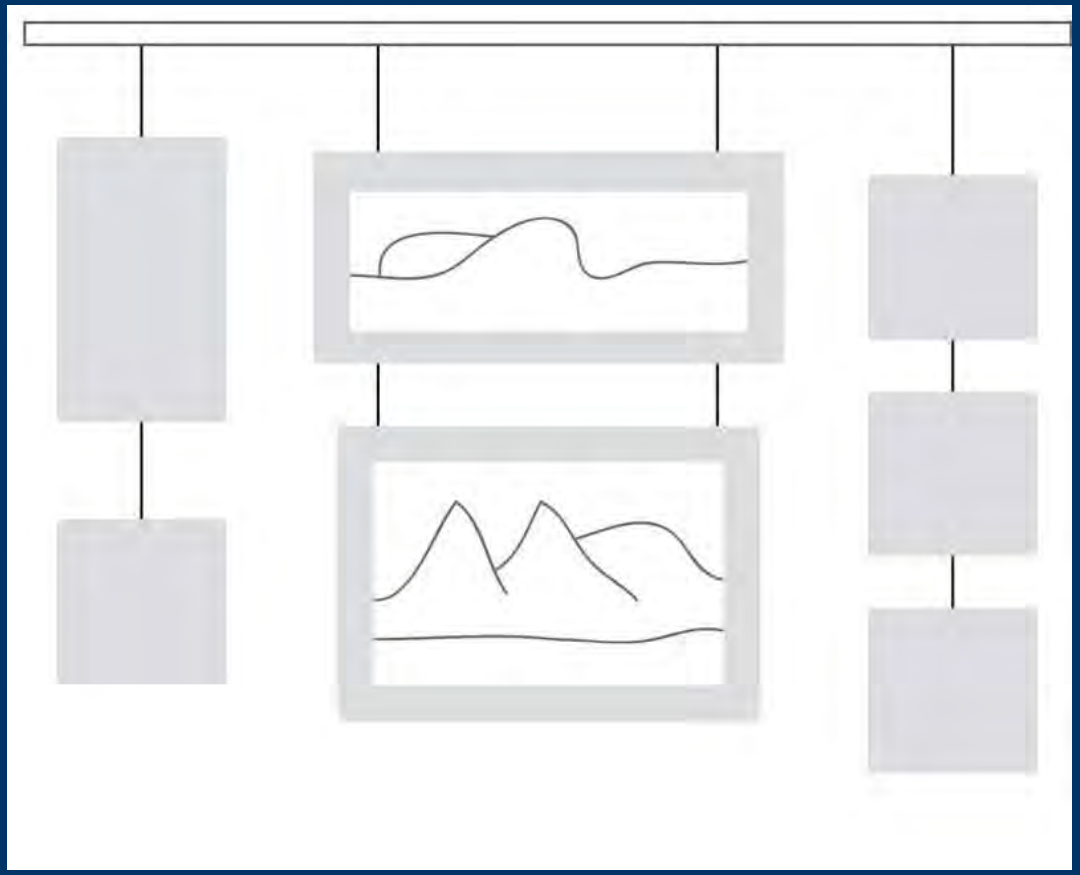
Board-Free Bulletin Board

To go one step further would be in the creative use of the same fittings (tensioned cables and acrylic sleeves) to create a “bulletin board,” except this bulletin board mitigates many of the shortcomings of common boards. This one never looks messy, needs no push pins or staples and adds structure and organization.

The illustration depicts a board-free bulletin board that is made from, now familiar, hanging system components—tensioned cables and acrylic sleeves. Various pocket locations can be labeled for routine special interests so these audiences may readily find what is of interest to them. This approach works well for community centers, church centers, schools, employee centers, and many other similar organizational applications.

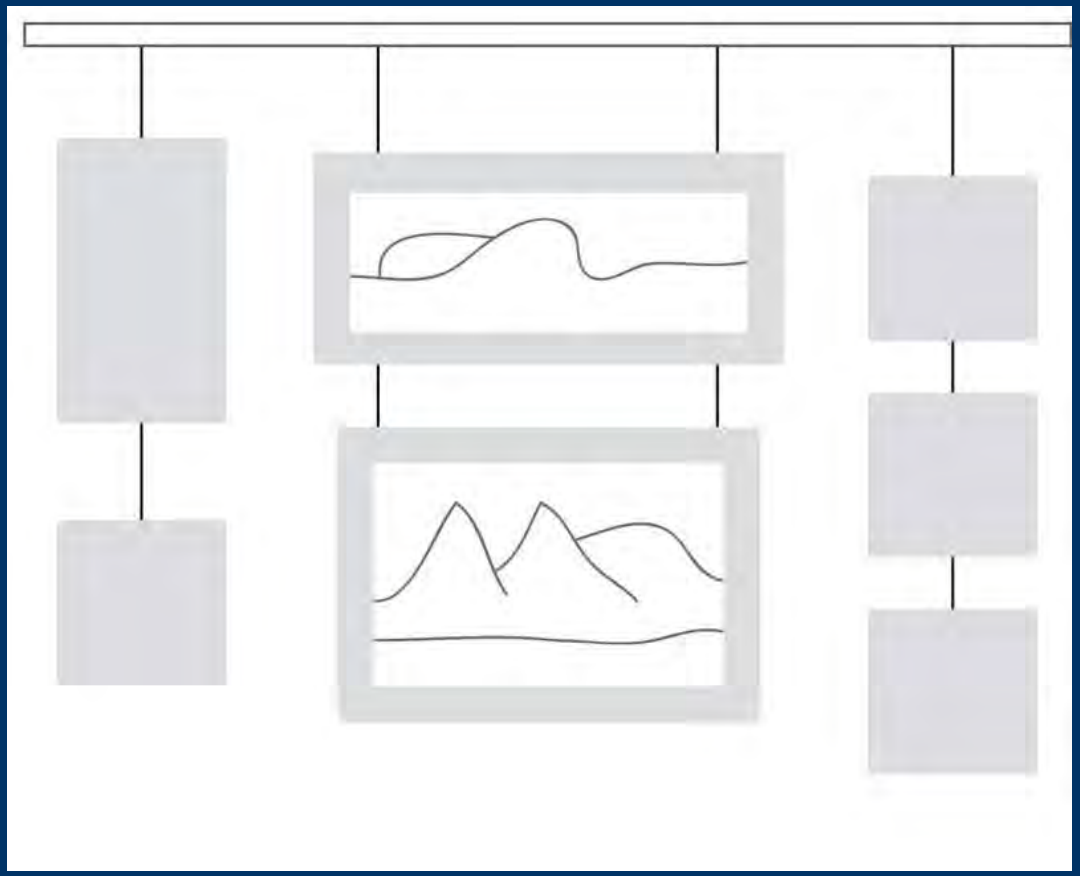
REVIEW QUESTION

Can multiple objects be hung from one (or more) cables/rods?



ANSWER

As long as the weight capacity of any individual component is not exceeded, you can hang any number of items on a single, or a pair of cables/rods.



Sustainability & LEED

LEED Points

At least one prime supplier in this specialty market offers a 3-Part CSI Formatted Spec describing how hanging systems can contribute to LEED points achieved on projects deploying their hanging systems.

Hanging systems may contribute to LEED points under a number of the LEED rating systems.

Project Sustainability

Perhaps the most significant sustainability benefit attributed to hanging systems is not yet addressed by LEED. This benefit is achieved in conventional permanent-wall office space where hanging systems are deployed to minimize the project's impact on the environment, the reduction of resource consumption—paint. Let's explore an example.

Let's analyze the executive offices in a typical corporate HQ office building. There are 20 such hypothetical offices in this building project, each occupied by a busy executive who has his/her own possessions (plaques, awards, certificates, photographs and art) hung from office walls. In the corporate world we can count on one thing—"change"—in the way of reorganization, promotions, reductions, realignments, etc.

Project Sustainability

By any name, they all cause what we might refer to as “office migration.” Over a 30-year life of this building project, office migration will cause the occupant of any single office to change about once every three years, or about ten times per office, and about 200 times in total for these 20 offices.

In a conventionally finished space (without hanging systems), when a change is to occur, the prior occupant departs and leaves with his/her personal effects. Next, facilities management patches all the walls (where nails were supporting objects) and repaints the office.

Assuming these 20 offices average 12’ x 12’ in size and have eight-foot ceilings, each of these 200 refreshes will consume two gallons of paint, 400 gallons in total.

If these offices were fitted with hanging systems, these 400 gallons of paint would be saved—not to mention the sandpaper, plastic sheeting, masking products, and other painting supplies. At a time when the A&D industry is looking to reduce consumption of very small amounts of product, it is time to embrace a concept that shows the potential to save so much more.

Project Sustainability

By now you might ask, “But what about cost?”

Let’s start by listing several assumptions of our example.

- The average executive office in our project is 12 x 12 feet with eight-foot ceilings.
- Interior paint is $25.00/gallon.
- Burdened labor cost for a facilities manager/painter is $25.00/hr.
- There is no inflation impact on the cost of paint or labor for 30 yrs.

We can all agree these are conservative numbers especially for the paint cost. Even if you might quibble on an item, in total these are very conservative.

An office refresh will consume two gallons of paint and eight hours of labor, so a refresh will cost approximately $250.00. There will be 200 office refresh cycles among these 20 offices over the next 30 years. The total cost of these tasks will be in the area of $50,000, conservatively.

Project Sustainability

The cost of installing a simplistic system in these offices would approximately $350/office, or $7,000 in total. When we compare the refresh cost of one office against the cost of equipping a single office with hanging hardware, we find a return on the investment. If the hanging system avoids as few as two paint applications in the building life cycle, money is saved. An investment of $7,000 to properly equip all 20 offices avoids $50,000 in maintenance expenses over the project life.

With a hanging system installed at the time of original occupancy, office migration would be very different as well. When an office occupant departs, the task for facilities management would be much simpler. The executive's items would simply be removed from the walls—just as items from a drawer are removed. This allows the next occupant to move in the same day. The lag time between move-out and move-in could be reduced from a day or two to an hour or two. The domino effect of several interdependent moves is more significant: weeks can be reduced to days.

Hanging systems are "green," but also save both money and time.

Summary

Summary

- The primary benefits of implementing “hanging systems” into new construction, as well as retrofitting within existing projects, are reduced maintenance, the flexibility to place objects on difficult walls or commonly avoided high-value walls, and the freedom to design or re-design as desired.
- The basic elements of any hanging system are a track that is horizontally mounted to a wall or ceiling, a cable or rod that hangs vertically from the track, and a variety of hooks and fittings that act to attach a wall object to the system.
- It is important to carefully consider the attributes of the various systems in order to choose the appropriate system for the design project.
- When specified early in the project, hanging systems can be integrated into the design and can either be masked or featured as an architectural element.
- Hanging systems can contribute to LEED points achieved on projects, and sustainable benefits are achieved where hanging systems are deployed to minimize the project’s impact on the environment.

Conclusion of This Program

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