



**MECHANICAL  
HANDLING**

**TECHNICAL INFORMATION BROCHURE**



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**MET-TRACK<sup>®</sup>**  
ENCLOSED TRACK LIFTING  
**GOLD SERVICE HANDLING SOLUTIONS**

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**Metreel**

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**INTRODUCTION**

Metreel's new Gold Service combines our knowledge, vast experience and technical capability with one of the premier Enclosed Track Systems available. We offer our clients confidence. In consideration of operator ergonomics, capital cost and building layouts we make sure our systems offer the best value for money solution. Our dedicated team of sales, design and installation engineers offer an excellent package of services including consultation, survey, design, special manufacture, installation, commissioning and servicing.

**PROFILES**

The **MET-TRACK**® Enclosed Track is the principal element of the handling solutions we offer, it is particularly suited for cranes, jib cranes, monorails and conveyors, but can be utilised for many other applications. Five standard tracks offer a lifting capacity of up to 4400lbs utilising a variety of lifting devices.

Available in standard or special finishes, including 3 profiles in stainless steel, the **MET-TRACK**® system offers the customer the option to customise any installation appearance.

The high strength/low weight factor of the tracks reduce the need for expensive steelwork which in turn simplifies installation and future system modifications.

**CURVES**

A complete range of curves offer ultimate flexibility for any conveyor or monorail system. When planning a system that requires bends we always advise utilising standard radii if possible, however for those applications which dictate special radii, these are also an option.

**SPLICE JOINTS**

Precise alignment is one of the major features which makes the **MET-TRACK**® enclosed track system one of the smoothest in operation. Horizontal and vertical adjustment screws supplied integral with each splice joint provide this finite adjustment for the joint of each track profile.

**SUPPORT BRACKETS**

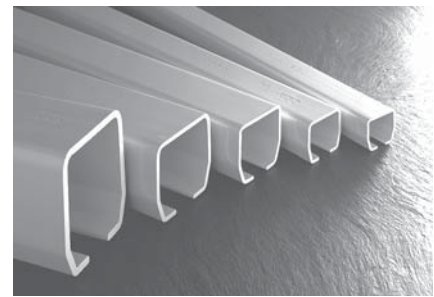
A wide range of standard support brackets to suit most building constructions and supporting steelwork is available. In the event of a requirement for special mounting, we have the capability to design special manufactured items completely to customers requirements.

When considering any system and the method of mounting, it is essential that the roof, ceiling or floor structure is of adequate strength for the proposed system. We recommend consultation with a qualified structural consultant to advise in this area.

**SUSPENSION TROLLEYS**

A vast selection of two, four and eight wheeled suspension trolleys offer connection to endless possibilities of equipment being transported.

Free running sealed wheels are a standard feature of **MET-TRACK**®. Special options such as waterproof and high temperature are also available. The design of our profiles protect the wheels and ensure minimum friction for the complete range of our suspensions trolleys.



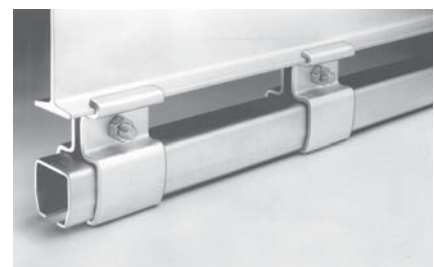
**MET-TRACK PROFILE RANGE**



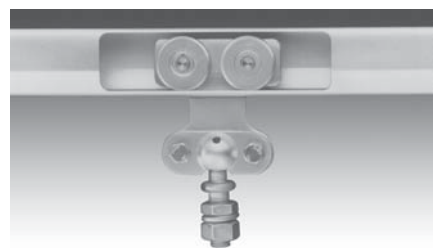
**CURVES**



**SPLICE JOINT**



**SUPPORT BRACKETS**



**SUSPENSION TROLLEY**



**INTRODUCTION**

**SPINES**

The **MET-TRACK®** system offers three spine options, a bolt on version which utilises standard system brackets, a welded plate spine and finally a vierendeel type construction. All three options are illustrated opposite.

**TURNTABLES**

The use of standard turntables and multi-directional units at track joints will add greater flexibility to any monorail or conveyor system. All the **MET-TRACK®** turntables rotate freely on precision ball bearings and are easily operated and positioned using one of several control mechanism options.

Standard turntables provide interconnection for up to four tracks, however additional connections can be incorporated.

Mechanically operated turntables are recommended for applications where the work flow is moderate and intermittent. For applications requiring continuous flow we recommend the use of our multi-directional units which feature a range of settings according to production requirements.

**SWITCHES**

Designed to facilitate branching off from the main line conveyor or monorail track. Two types of standard switches are available, the Swivel Switch offers a maintenance free, easy to operate solution. The basic element is a pivoting track section which incorporates a mechanical stop to close off the inoperative track.

The alternative, a Tongue Switch, is a compact design which gives a particular advantage when several branch lines are required in close proximity. The basic element is a tongue guide which is suited to either manual or automatic operation.

Our switches are normally manually operated, however they can be assisted by electric, pneumatic or hydraulic power.

**ENTRY/EXIT SECTION**

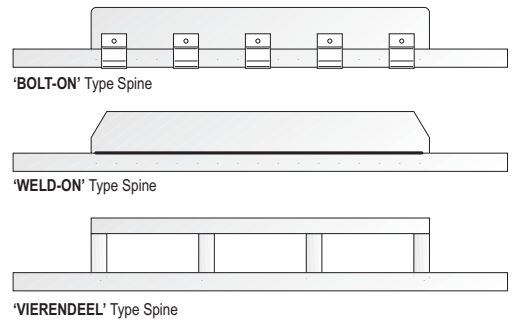
This unit operates in a similar way to the swivel switch and facilitates the insertion/removal of trolleys at a required position, ideally suited for a closed loop system where work flow can increase and decrease and suspension trolley quantity needs to be modified.

The basic element is a pivoting track section which incorporates a mechanical stop to close off the open end.

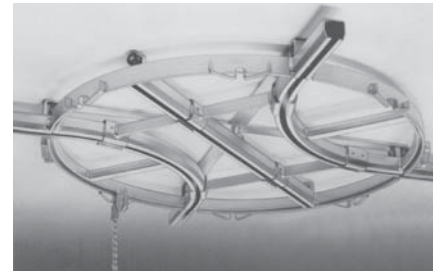
**DOOR SWIVEL SECTION**

The door swivel section enables the track to be interrupted automatically by a sliding door for reasons of security or emergency. Typical examples being cold room or fire protection doors.

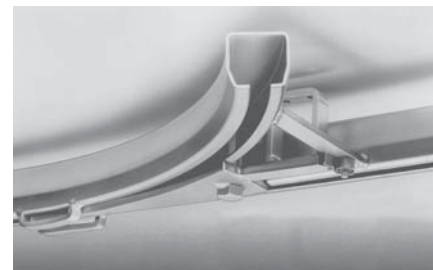
Safety devices are incorporated to ensure that the trolleys cannot disengage from the track during operation.



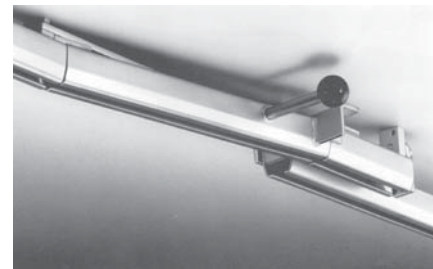
**SPINE OPTIONS**



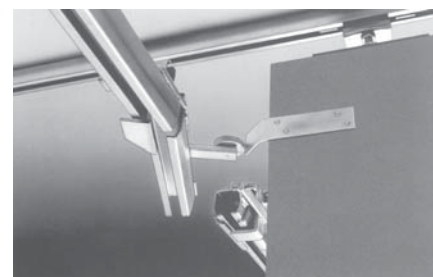
**TURNTABLES**



**SWITCHES**



**ENTRY/EXIT SECTION**



**DOOR SWIVEL SECTIONS**

**INTRODUCTION**

**POWER AND FREE**

A power and free facility can be achieved by incorporating a supplementary drive system. The most popular system being our motorised flexible chain placed alongside the conveyor track. This system can provide total automation but is mainly utilised to automate a specific section of a track system.

Typical applications being where components have to be carried through restricted areas, i.e. chemical tanks, spray booths and ovens etc.

**DROP LIFT SECTION**

The drop lift section has been designed to provide a facility for raising and lowering trolleys and load carriers with buffers at specific locations with a conveyor or monorail system.

This simple and effective unit includes many automatic features and is ideally suited for installations incorporating de-greasing baths, dip tanks, coating/galvanising plants, goods loading and transfer.

This unit features automatically operated mechanical stops to ensure complete safety during operation.

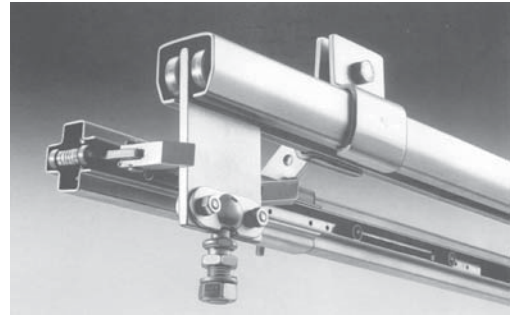
**POWERED TRACTOR DRIVES**

A standard range of tractor drives are available for applications where power travelling of the crane bridge and/or hoist trolley are required.

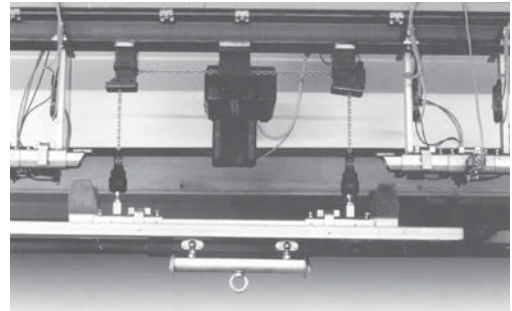
Traverse speeds can be varied in order to meet customer requirements.

**TRACK TRANSFER UNITS**

These units are designed to provide a safe, efficient and easy to operate transfer of a hoist/trolley from a crane bridge into an adjacent crane bridge, or alternatively into a monorail system.



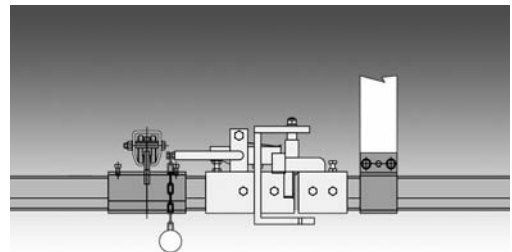
**POWER & FREE**



**DROP LIFT SECTION**



**POWERED TRACTOR DRIVES**

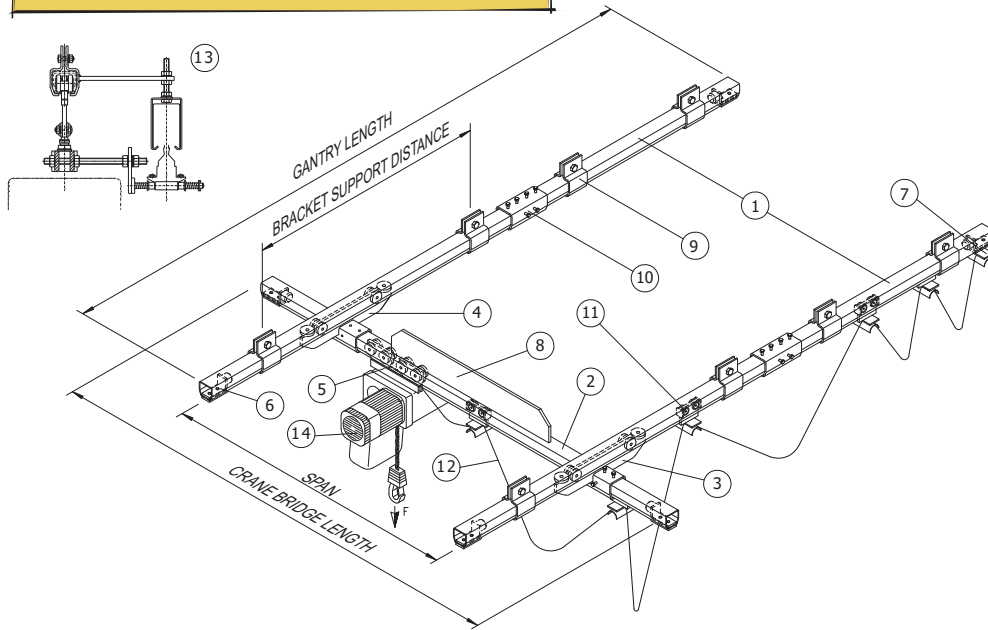


**TRACK TRANSFER UNITS**

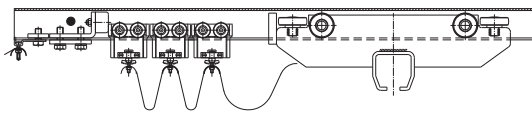




**TYPICAL LIGHT CRANE SYSTEM**



1. Gantry Tracks
2. Crane Bridge
3. Fixed End Truck
4. Floating End Truck
5. Hoist Trolley
6. End Stop/Buffer
7. End Stop/Cable Clamp
8. Crane Bridge Spine
9. Support Bracket
10. Splice Joint
11. Cable Festoon Trolley
12. Platform Cable
13. Conductor Support Assembly
14. Lifting Device e.g. Hoist



**LOADINGS (POINT LOAD)**

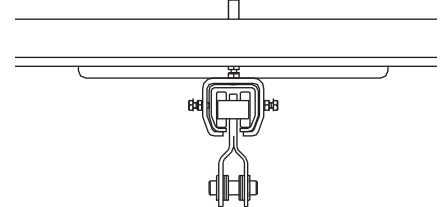
<b>Load (lbs)</b>	176	330	551	1102	2204	4409*
<b>Profile</b>	300	400	500	600	700	700*

\* Utilising a double bridge crane

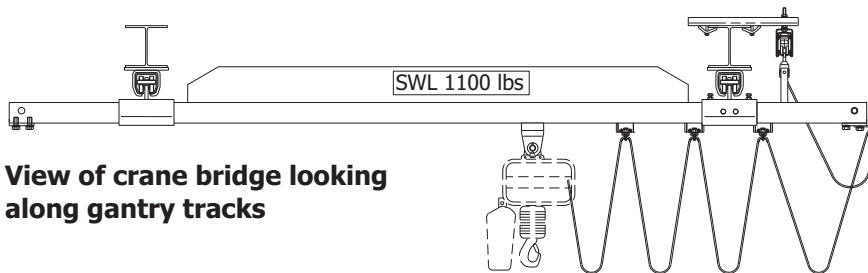
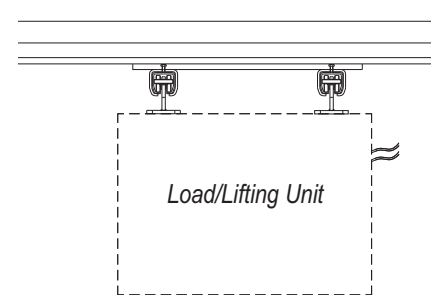
**EXAMPLE CRANE BRIDGE OPTIONS**

The above illustration below shows a typical arrangement of a standard **MET-TRACK**® Light Crane. To the right we show typical crane bridge assemblies, normal installations call for the single bridge type, however sometimes due to safe working load or complexity of the lifting device we may use a double bridge arrangement. Power supply to both the gantry and crane bridge are also available, the illustrations below shows a typical conductor system within the gantry travel and a simple festoon for the crane bridge travel, this combination ensures minimum cost with maximum travel usage.

**Single Bridge Gantry**



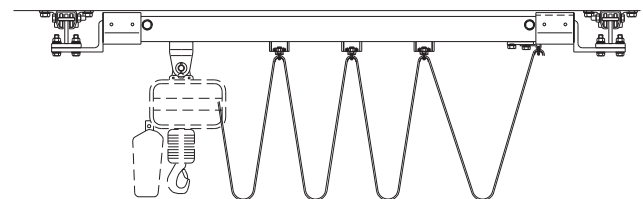
**Double Bridge Gantry**



**View of crane bridge looking along gantry tracks**

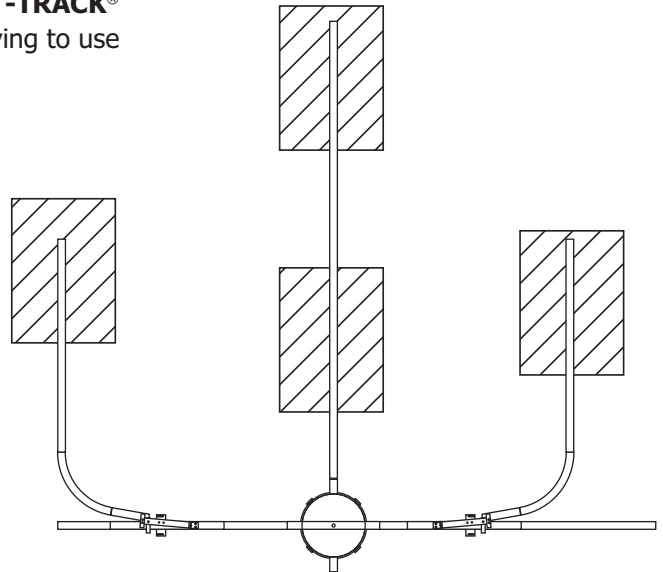
**RESTRICTED HEIGHT**

Restricted height assemblies of single and double crane bridges are used in areas where it is necessary to use the absolute minimum headroom for the crane assembly, thus offering maximum height of lift for the lifting device. The standard **MET-TRACK**® is designed to reduce headroom as normal, this option offers the ultimate answer for those difficult applications.



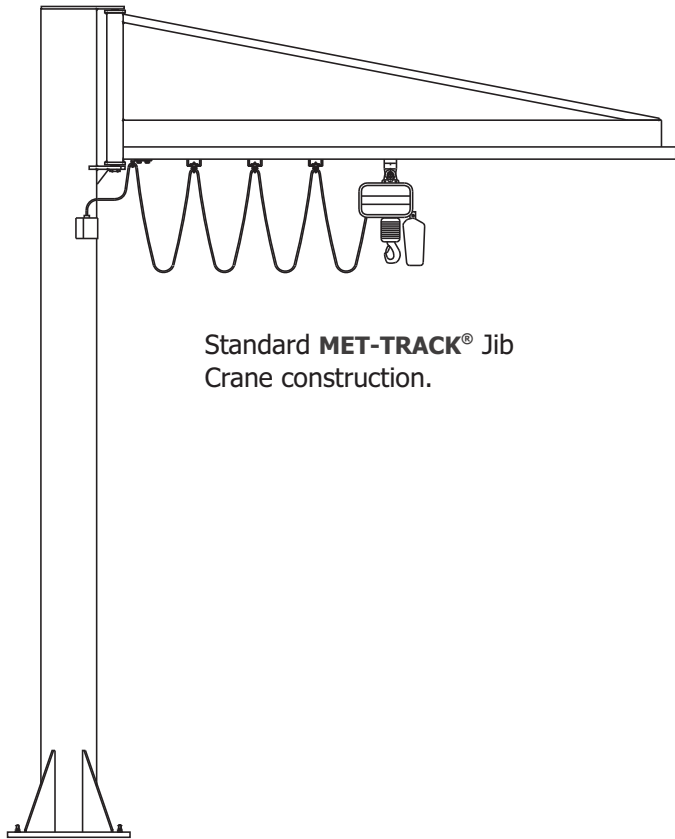
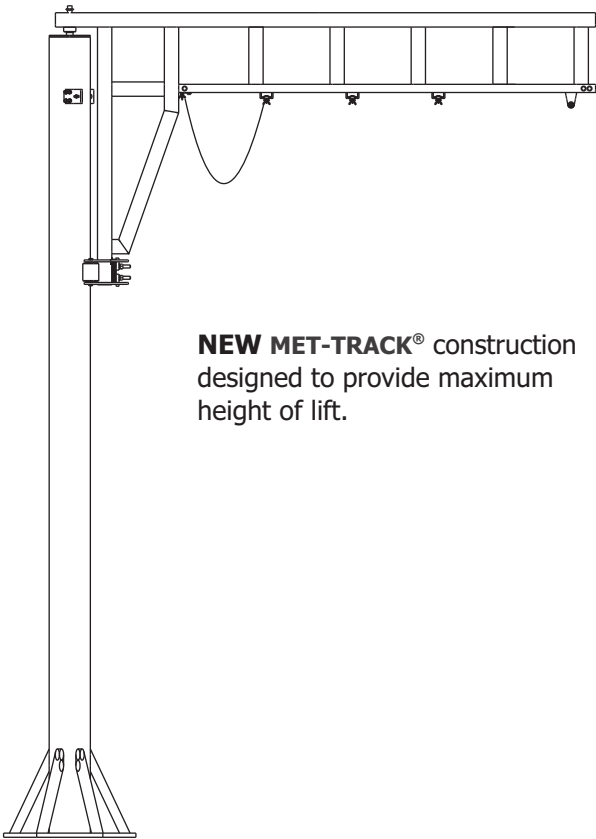
**TYPICAL MONORAIL CRANE SYSTEM**

A monorail offers a lifting facility for a working area which spans various locations. Utilising switches, bends and turntables the **MET-TRACK®** system transports your load to each work area without having to use additional lifting apparatus.



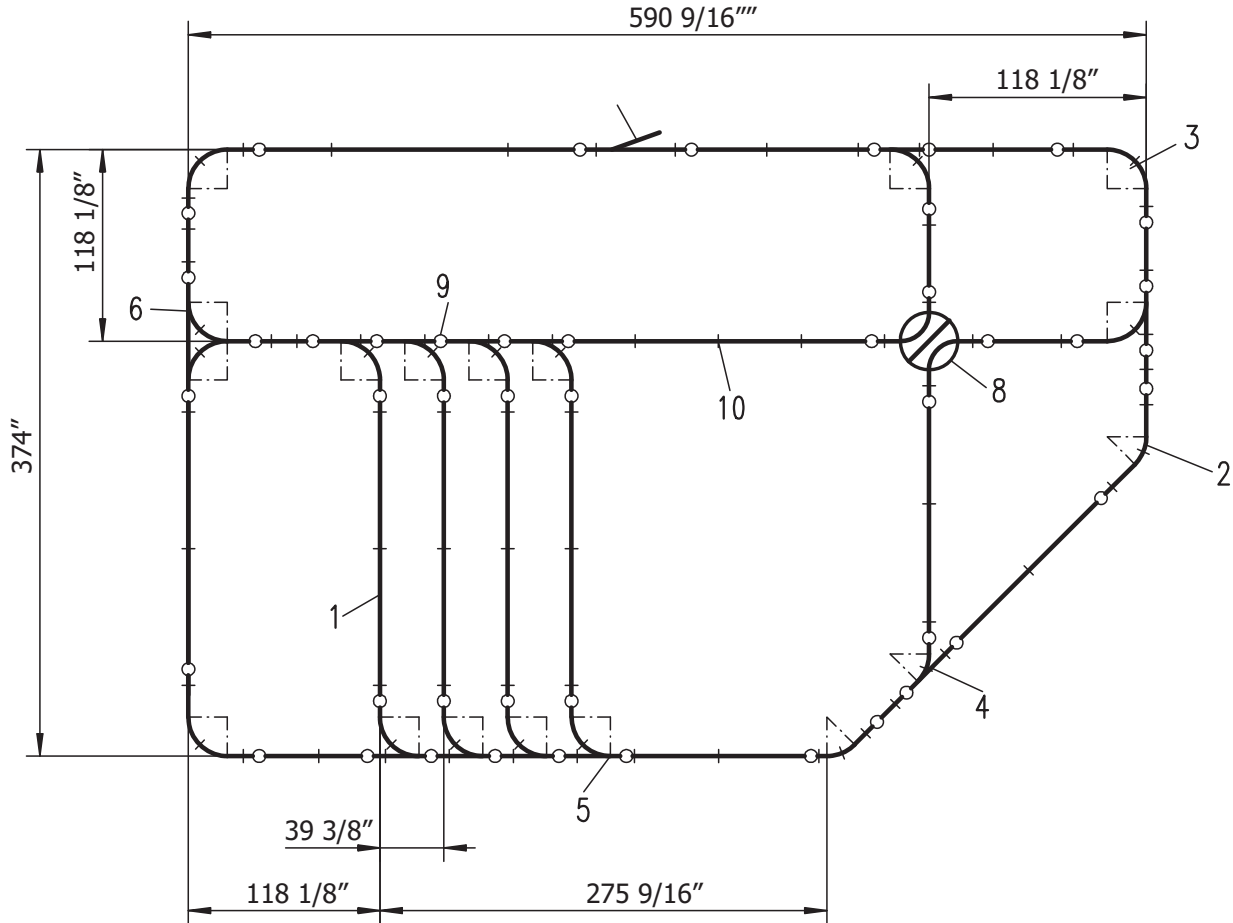
**TYPICAL JIB CRANE SYSTEM**

The jib crane is an economical method of moving materials within an individual work station. Jib cranes range from entirely self supporting styles to styles that mount to existing building columns or walls.

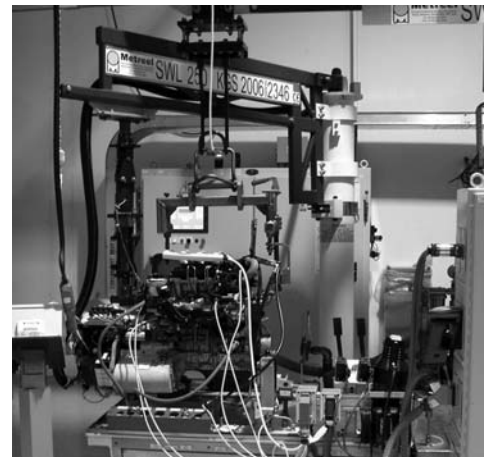


**TYPICAL CONVEYOR SYSTEM**

Similar to a monorail the conveyor offers lifting and transportation to many locations around the work area. The difference being that the track system is designed with a closed loop configuration, this enables a number of loads to be transported around the same system. Ideal for an automated production line. Power and Free options are also available, please consult our sales office.



- |                                   |                                       |                                |
|-----------------------------------|---------------------------------------|--------------------------------|
| 1. Standard Track Profile Lengths | 5. 90° Swivel Switch                  | 8. Multi-directional Turntable |
| 2. 45° Track Bends                | 6. 90° Swivel Switch (Bi Directional) | 9. Splice Joints               |
| 3. 90° Track bends                | 7. Entry/Exit Section                 | 10. Support Brackets           |
| 4. 45° Swivel Switch              |                                       |                                |

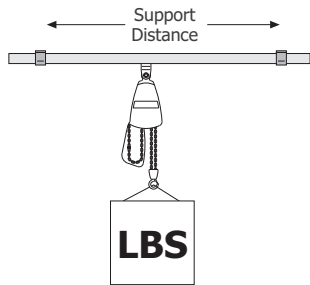


**LOAD CONFIGURATIONS**

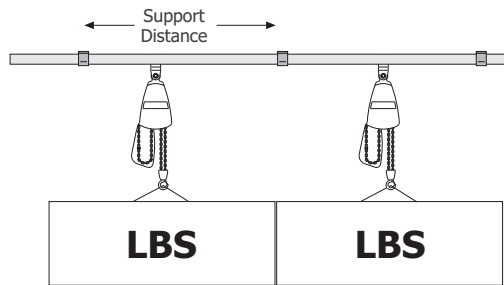
After determining the weight of the load, you now need to consider the load configuration. This refers to the type and number of loads required within your system. The two configurations that are common on lifting systems are the "Point Load" and the "Uniformly Distributed Load". Both configurations are explained in further detail below.

**POINT LOAD**

A Point Load is a single occurrence of a load applied to a track profile between two support centres. Typical for cranes and monorails this type of load is usually suspended on a lifting device, such as a hoist, where a single load can travel the full extent of the system. Multiple loads can be considered as a Point Load if the loads are prevented from ambushing together at centres less than the support distance. The following illustrations show typical situations where a Point Load configuration should be considered.

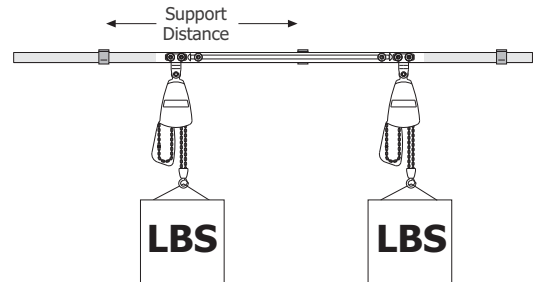


Typical **Point Load** where there is one single load being carried around the system.



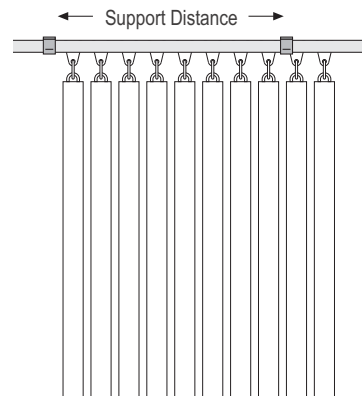
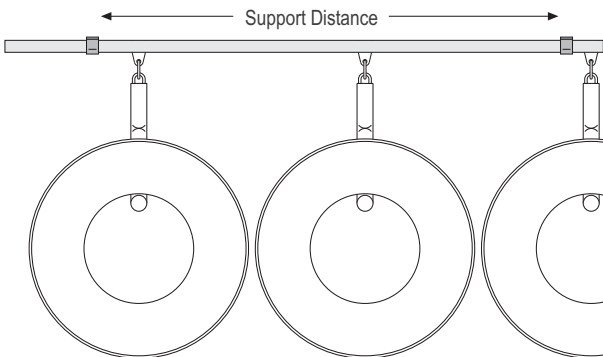
In this illustration the load would be considered as a **Point Load** due to the fact that the load is wider than the support distance and therefore only one occurrence of the load can fall between 2 support centres.

By using a load spacer you can limit the number of loads that fall within a support distance. This will also be calculated as a **Point Load**.



**UNIFORMLY DISTRIBUTED LOAD (UDL)**

A UDL (Uniformly Distributed Load) is where multiple loads can be so positioned that each load has an effect on the deflection of the track between support centres. For example consider a load of 100lbs having a total length of 12", it would be possible for 5 such loads to be positioned where the support distance was 5'. Therefore the load between supports is much greater than 100lbs. The following illustrations show typical situations where a UDL configuration should be considered.





**LOAD CONFIGURATIONS**

**SUPPORT DISTANCES - POINT LOAD**

Using the information already determined from the previous pages, you will now be able to select the appropriate maximum support centres for your application.

If you plot your maximum load against the vertical axis and then follow this line until it meets the capacity curve of the profile selected, the intersecting point determines the maximum support centres as detailed against the horizontal axis.

Typical examples are shown for your reference:

**400 Profile**

Load = 187lbs

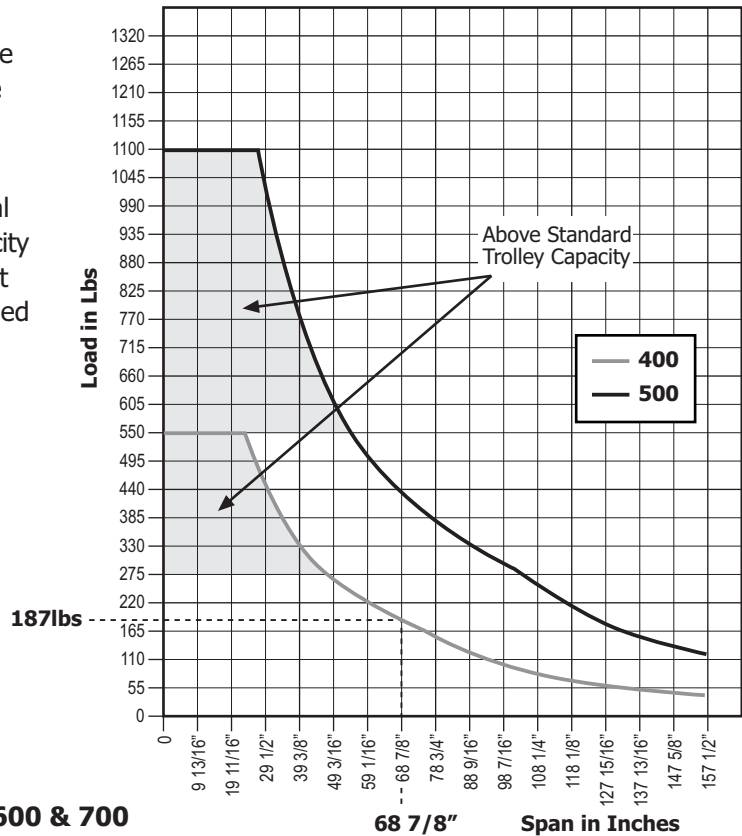
Maximum Support Centres = 5ft 8 7/8"

**600 Profile**

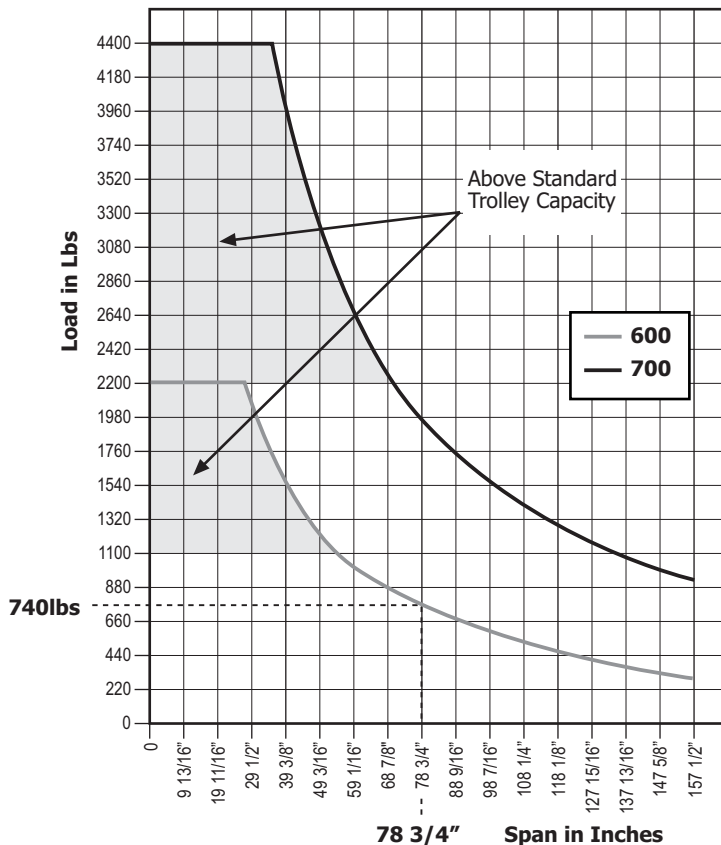
Load = 750lbs

Maximum Support Centres = 6ft 8 3/4"

**Track Series 400 & 500**



**Track Series 600 & 700**



**Please note the following:**

- 1) If the results are border line for your desired load and required support centres we recommend that you consult our sales office for further technical advice.
- 2) The safe working load for each system is primarily determined by the carrying capacity of each roller unit. As standard our roller units/trolleys work to the following SWL: Series 400 - 275lbs, 500 - 550lbs, 600 - 1100lbs & 700 - 2200lbs. Having stated this we do offer alternative roller units/trolleys which will carry capacities up to double the figures mentioned above. Our graphs show the maximum permissible load for the track but the maximum load of the roller unit/trolley must also be considered.



**OTHER DESIGN CONSIDERATIONS**

**PROFILE CANTILEVER (K)**

The table opposite gives the maximum cantilever allowed for each track profile. The dimension is based on the Safe Working Load for each profile. Greater cantilevers may be possible depending upon the load - consult our sales office for further assistance.

In the case of a gantry that contains a cable festoon system for an electric hoist or similar device, the cantilever may be extended to accommodate the festoon - consult our sales office for assistance.

We recommend that all joints are positioned within the maximum cantilever distance from the support position.

Profile	Load	Maximum Cantilever
400	275lbs	22 1/4"
500	550lbs	28 3/4"
600	1100lbs	30 1/2"
700	2200lbs	36 7/16"

**CABLE FESTOON POWER SUPPLY**

When using a cable festoon system as your power supply, within the track profile, we recommend that you fit a bolt, to act as a travel limiter, to protect the cable trolleys from damage which may be caused by suspension trolleys/end carriages crushing the trolleys at the extreme end of the travel.

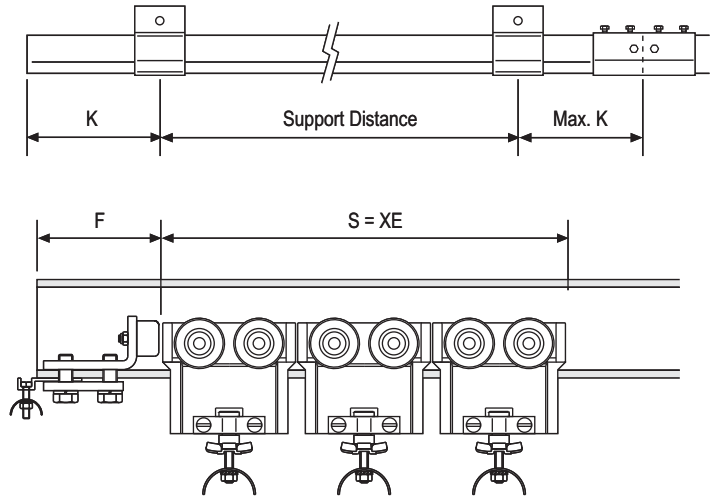
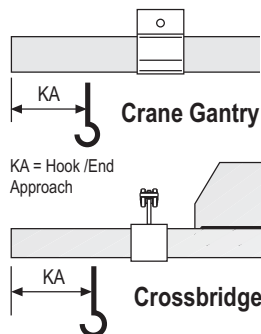
**CALCULATING THE NO. OF CABLE TROLLEYS**

The number of cable trolleys required is determined the travel distance (L) and the permissible loop depth (LD). With this information to hand use the following formula to calculate the number of trolleys:

$$\text{No. of Cable Trolleys} = \frac{L}{2 \times LD} + 10\% - 1$$

**HOOK/END APPROACH**

When considering the crane gantry/cross bridge and the effective coverage the hook/end approach distance must be known to ensure the crane can reach the extreme work area positions.



(S) Storage area of cable feed trolleys (X)= Number of cable trolleys  
(E)= Cable Trolley Length (+15%)

**POWERED SYSTEMS**

When supply power to a hoist is via a festoon arrangement the hook/end approach distance is increased due to the storage distance required at the ambush end. Please note that these dimensions only refer to the ambush end, the other end of the travel will have a hook/end approach as per a manual system.

**Crane Gantry**

Profile	KA (ft / in)
400	S + 10 13/16"
500	S + 13 3/8"
600	S + 14 15/16"
700	S + 16 15/16"

**Crossbridge**

Profile	KA (ft / in)
400	S + 4 15/16"
500	S + 7"
600	S + 8 1/16"
700	S + 9 5/16"

**MANUAL SYSTEMS**

For systems which do not have in-track festoons the following tables can be used to determine the hook/end approach distances.

**Crane Gantry**

Profile	KA (ft / in)
400	10 13/16"
500	13 3/8"
600	14 15/16"
700	16 15/16"

**Crossbridge**

Profile	KA (ft / in)
400	4 15/16"
500	7"
600	8 1/16"
700	9 5/16"