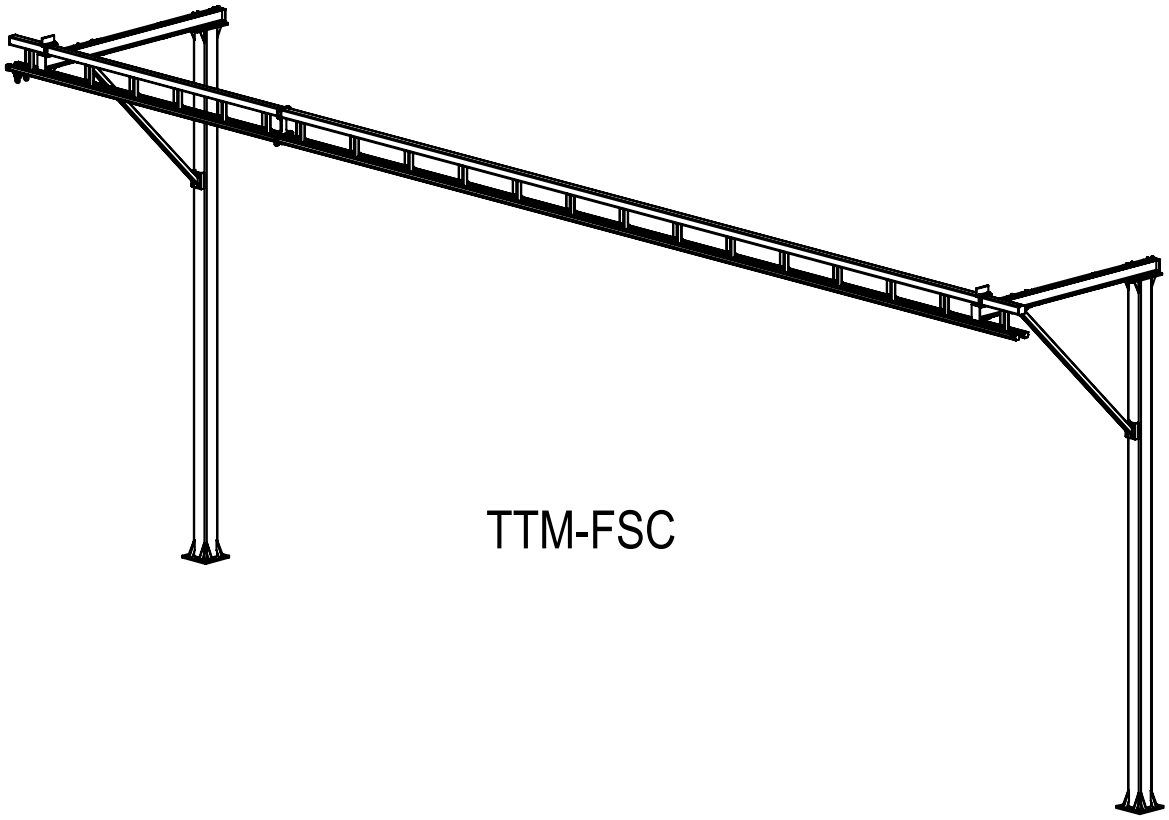
GORBEL®
A CLASS ABOVE

TETHER TRACK™
FALL PROTECTION SYSTEMS

Installation, Operation, & Maintenance Manual



TTM-FSC

IMPORTANT!
DO NOT DESTROY

Tether Track®
Free Standing Cantilever Rigid Rail Anchor Systems

Gorbel® Customer Order No. / Serial No. _____

Gorbel® Dealer _____

_____

Date _____
Month Year

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Questions? Concerns? Comments? Please call (800) 821-0086 (US and Canada) or (585) 924-6262 (outside US).

INTRODUCTION

Thank you for choosing a Tether Track® Free Standing Cantilevered Monorail by Gorbel to solve your fall protection needs. Extensive testing, years of component history and quality manufacturing are leveraged to provide the ultimate value and safety in your Tether Track® Rigid Rail Anchor System. The Free Standing Cantilevered Monorail Systems are optimally designed to require a small support footprint while protecting a large fall zone. Up to 50 foot support centers are standard. These systems are also optimized for outdoor use by including ice and wind loads, designing for wind buffeting per AASHTO guidelines, lining the enclosed track with a durable coating, utilizing leveling nuts for the groutless column bases, and using corrosion resistant hardware.

The engineered systems comply with OSHA's required safety factor of 2 and are designed in accordance with ANSI Z359.6. Furthermore, Tether Track® Free Standing Cantilevered Monorail Systems are designed to be statically proof tested up to 110% of the maximum arresting force (MAF) without incurring any visual permanent deformation. Following a fall event, this allows the system to be readily returned to service after performing the inspection procedures detailed in this manual.

When properly applied, configured and installed under the supervision of a qualified person, Tether Track® Free Standing Cantilevered Monorail Systems will allow unsurpassed user mobility through the use of self-retracting lanyards (SRLs) attached to Tether Trolleys™, freely rolling on clean, rigid, enclosed track. Superior safety is achieved through minimizing fall distance, reducing swing falls, and eliminating secondary falls by keeping the anchor point overhead on the Tether Track® Rigid Rail Anchor System. This reliable performance combined with an ANSI approved Managed Fall Protection Program gives the user the utmost safety assurance and encourages further safe work practices.

APPLICATION

Tether Track® Free Standing Cantilevered Monorail Systems are the best choice for providing coverage to a rectangular fall zone where there is no existing support structure. The rigid anchorage, maintaining the anchorage trolley overhead and the use of a "Class A" Self Retracting Lanyard provides the best solution to minimize fall distance when fall clearance height is restrictive.

Note: Standard design is for a maximum arresting force of 900 lbs. and a maximum worker weight (with tools) of 310 lbs. If your SRL has a higher rating, it must be specified at the time of quote.

Foundation quantity may be minimized by using 1 or 2 person monorails with 50 foot support centers. For these long spans, track plate style splices are used to keep the longest component to a 40 foot length for easier shipping and handling. Systems with smaller support centers and shorter cantilevers may be able to be installed on existing reinforced concrete floors. Alternatively, Free Standing Monorails (goal post style supports) may be used to reduce foundation requirements. Foundation requirements provided on the General Arrangement Drawings are based on 3000 psi concrete strength and 2500 psf allowable soil bearing strength.

This product meets all applicable OSHA and ANSI standards for fall protection.

Dimensions contained in this installation manual are for reference only and may differ for your particular application. Please refer to the enclosed General Arrangement Drawing for actual dimensions.

Normal safety precautions: These include, but are not limited to:

- Checking for obstructions in the fall clearance zone
- Coordinating fall hazard activities with assigned rescue personnel
- Making sure that end stops are in place
- Making sure that trolley freely moves

For additional safety precautions, see pages 13 and 14.

WARNINGS

1. Do not throw away these instructions.
2. Only competent erection personnel familiar with standard fabrication practices should be employed to assemble these anchor systems. Gorbel is not responsible for the quality of workmanship employed in the installation of an anchor system according to these instructions. Contact Gorbel Inc. at 600 Fishers Run, P.O. Box 593, Fishers, New York 14453-0593, 800-821-0086, for additional information if necessary.
3. Consult a qualified foundation engineer to determine if your existing slab or ground is adequate to support the loads generated by the anchor bolt force, overturning moment, and axial load of the Tether Track® Free Standing Cantilever Monorail System. Gorbel Inc. assumes no responsibility for the adequacy or integrity of mounting surface.
4. Read and understand this manual before using equipment.
5. This manual should be read and understood in its entirety, and used as part of a training program as required by OSHA or any state and local regulatory agency.
6. This and any other included instructions shall be provided to the users of this equipment. The user shall understand the proper equipment use and limitations.
7. The Tether Track® Free Standing Cantilevered Monorail System is only to be used as part of a complete fall protection system. The buyer or user is responsible for the safety and compatibility of the complete system.
8. Any component replacement, addition or change to the anchor system or the complete system requires evaluation by a qualified person.
9. Any fall event can result in injuries. The proper use of this equipment can substantially reduce an injury. For maximum safety, the worker shall be trained in the proper use of this equipment and all of the components of the fall arrest system.
10. Before each use, the equipment shall be inspected as outlined in the inspection section of this manual.
11. The rated capacity, the rated maximum arresting force, and the rated number of workers of the Tether Track® Free Standing Cantilevered Monorail System shall not be exceeded. The maximum arresting force rating of the lanyard or SRL connected to the Tether Track® Free Standing Cantilevered Monorail System shall not exceed the rated maximum arresting force of the Tether Track® Free Standing Cantilevered Monorail System.
12. A managed fall protection program which includes a rescue plan is required for the safe use of this equipment. A worker suspended from this system can lose vital blood flow to the brain as blood pools in the legs. This is referred to as suspension trauma. Training can be critical. For example, an immediate rush of stale, pooled blood can cause heart failure. Do not allow the rescued worker to lie flat.
13. Reference the American Institute of Steel Construction (AISC) Manual of Steel Construction, Specification for Structural Joints using ASTM A325 or A490 Bolts (section 8.d.2) for the proper procedures to follow when using any torque tightening method.
14. Do not field modify the Tether Track® Free Standing Cantilevered Monorail System in any way. Any modifications without the written consent of Gorbel Inc. will void warranty.
15. Gorbel has ensured the compatibility of Tether Track® **ONLY** with a Gorbel® approved anchor connector (fall arrest trolley). It is the responsibility of the dealer or end user to ensure proper design, function and compatibility of any trolley used with Tether Track® that has not been validated by Gorbel for a fall arrest application.
16. Failure to follow these instructions can result in serious injury or death.

RESTRICTIONS

1. The Tether Track® Free Standing Cantilevered Monorail System shall be used as part of a complete active fall arrest system. Neither Gorbel nor its distributor takes responsibility for the system as a whole. The Tether Track® Free Standing Cantilevered Monorail System is designed and tested by Gorbel in accordance with OSHA and ANSI Z359.1 & Z359.6 requirements using a minimum design factor of two. All components are designed in accordance with AISC guidelines.
2. The end user shall be responsible to make sure that the complete Fall Arrest System shall be designed, installed and used under the supervision of a qualified person in accordance with applicable OSHA regulations and ANSI Z359 Fall Protection Code voluntary consensus standard. State and local jurisdictions may have additional requirements.
3. It is the responsibility of the user to determine the sustainability of equipment and any attachments prior to each use and to have certification inspection on a periodic basis with recurrence not to exceed once per year by a qualified person.
4. Lanyards or self retracting lifelines (SRL) to be used with the Tether Track® Free Standing Cantilevered Monorail System shall have a maximum arresting force (MAF) equal to or less than 900 lbs or they shall have a maximum arresting force (MAF) equal to or less than the MAF rating of the Tether Track® Free Standing Cantilevered Monorail System.
5. Customer chosen lanyards or SRL shall minimize freefall distance.
6. It is the responsibility of the end user to verify that the mounting height of this Tether Track® Free Standing Cantilevered Monorail System will provide adequate fall clearance when used with the customer chosen lanyard or SRL and harness.
7. Each trolley shall have no more than one person attached.
8. Trolleys are designed to freely move. To prevent a swing fall and the lengthening of the free fall distance, the user shall verify the trolley maintains the closest possible distance to the user whenever he or she changes position.
9. The Fall Clearance Zone shall be free of dangerous obstructions and electrical hazards.
10. The Tether Track® Free Standing Cantilevered Monorail System shall be installed per the general arrangement drawing without deviation or modification.
11. This system is not designed to be used as a crane.

DEFINITION OF TERMS

AUTHORIZED PERSON - ANSI defines an authorized person as a “person assigned by the employer to perform duties at a location where the person will be exposed to a fall hazard”.

COMPLETE FALL ARREST SYSTEM - A complete fall arrest system consists of three main components:

A) Engineered Anchor System - Gorbel’s Tether Track® has been engineered to provide the maximum safety possible. This system allows for the greatest worker mobility through Gorbel’s ergonomic enclosed track design. It provides minimal fall distance by keeping the anchor point overhead and rigid.

B) Body Support - Only a full body harness is allowed for fall arrest systems. Proper fitting and wearing of the harness is critical so that it can evenly dissipate the fall arrest forces to the strongest body parts.

C) Connecting Means - This is the link between the anchor and body support. A self-retracting lifeline is recommended. This provides maximum mobility and minimum fall distance. An energy absorbing lanyard may also be used. These components have a maximum arresting force rating. Gorbel’s standard Tether Track® design is based on a maximum arresting force of 900 lbs. or less.

FALL CLEARANCE ZONE - The space below the person where there is a potential to fall. This space must remain clear of obstructions to prevent injury from contact with any objects during a fall event.

LEADING EDGE - The edge of the working surface that a person could fall off. This edge, if located parallel with the Tether Track® Monorail, may restrict the lifeline from reaching a vertical orientation and cause off-vertical (horizontal) loading of the anchorage system. Avoid sharp leading edges or use lifelines designed to withstand a sharp leading edge fall event.

QUALIFIED PERSON - ANSI defines a qualified person as “A person with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, evaluating and specifying fall protection and rescue systems...”

INSTALLATION

STEP 1 - PRE-ASSEMBLY

TIP: Packing list can be found in plastic pocket attached to hardware box: General Arrangement Drawing can be found inserted in this installation manual.

1.1 Read entire manual **before** installing the Free Standing Cantilevered System.

1.2 Check packing list to ensure no parts have been lost prior to initiating assembly.

1.3 Tools and materials (by others) typically needed to assemble Free Standing Cantilevered System:

- Heavy duty drill
- Mallet
- Steel shims
- Man lifts
- Leveling tools (transit, laser level, water level, etc.)
- Beeswax or toilet wax ring
- Heavy duty drill
- Tape measure
- Steel anchor bolt templates (by others) for cast-in poured foundations
- Anchor bolts (by others, F1554 grade 36 bolts or better) for cast-in poured foundations
- Galvanized grade DH nuts, (4) per anchor bolt (by others) for cast-in poured foundations
- Galvanized grade F436 flat washers, (4) per anchor bolt (by others) for cast-in poured foundations
- Concrete, 3,000 psi strength min (by others) for cast-in poured foundations
- Torque wrench (up to 180 ft-lbs for 1” dia cast-in anchor bolts)
- Sockets and open wrenches (1/2” nut is 3/4” width, 5/8” nut is 15/16” width, 3/4” DH nut is 1-1/4” width, 7/8” DH nut is 1-7/16” width, 1” DH nut is 1-5/8” width)
- Anchor bolts (by others, grade 5 or better) for post-installed shallow foundations
- Lifting device to lift heavy columns, headers, knee braces and monorail(s)

1.4 Refer to the General Arrangement Drawing for foundation requirements. For indoor systems, if your floor is reinforced and meets the minimum thickness and area requirements, use **step 2B**, page 7, for Post Installed Anchor Bolts with Shallow Foundations. Otherwise, for Cast-in Anchor Bolts with Poured Foundations, use **step 2A** on page 5.

WARNING

Consult a qualified structural engineer to determine that your existing slab or ground is adequate to support the loads generated by the anchor bolt force, overturning moment, and axial load of the Tether Track® Free Standing Cantilevered Monorail System.

STOP!

Do not proceed if your foundation does not meet the size and loading requirements identified in **Step 1.4**.

1.5 For outdoor service, assemble lock nut on one end of all threaded rods. A vise or vise grip can be used at the middle of the threaded rod to prevent the rod from spinning while turning the lock nut.

WARNING

There must be a minimum of two threads showing at both ends of the threaded rod.

1.6 For outdoor service, wipe down and spray paint all threaded rod with the can of cold galvanizing spray paint provided.

STEP 2A - COLUMN INSTALLATION (POURED FOUNDATION)

NOTE: Monorail should not deviate by more than 0.5 degrees from horizontal. If application requires foundations at different elevations to achieve this, verify the General Arrangement Drawing details this so that columns can be fabricated to custom individual lengths.

WARNING

Verify foundation depth meets local codes to prevent frost heave. Contact Gorbel if revision to foundation depth on the General Arrangement Drawing is required. This may affect square width dimension.

WARNING

Consult a qualified engineer if you deviate from the recommended dimensions provided in this manual or on the General Arrangement Drawing. Gorbel. Inc. is not responsible for any deviation from these foundation requirements.

2.1 Cast in Anchor Bolts requirements:

A) All groutless columns using leveling nuts require cast-in anchor bolts.

B) Eight hole base plates are standard.

C) 3/4” or 7/8” diameter anchor bolts are used for most standard configurations with 1” diameter being required on the largest sizes. Refer to the General Arrangement Drawing for anchor bolt size.

D) Anchor bolts specified are ASTM F1554 Grade 36. Galvanized rods with a tacked nut are recommended. If plain bolts are used, coat the exposed portion using the cold galvanizing spray paint provided (anchor bolts supplied by others).

E) With the double nut moment base design, shear forces are transferred through the bolts. Therefore bolt holes in column base plate are not oversized. Anchor bolt templates are recommended to precisely hold anchor bolts in correct alignment during pouring and curing of concrete (anchor bolt templates supplied by others).

F) Anchor bolts are embedded three quarters of the footer depth with 4” to 6” of threaded rod exposed.

G) Galvanized grade DH nuts and galvanized grade F436 flat washers are recommended (anchor nuts and washers supplied by others).

2.2 Pour the footing according to the foundation dimension on the General Arrangement Drawing and in ***diagram 2A*** with the anchor bolts in place. Verify all footings are at the same elevation unless otherwise detailed on General Arrangement Drawing. Protect protruding threads on anchor bolts until columns are installed.

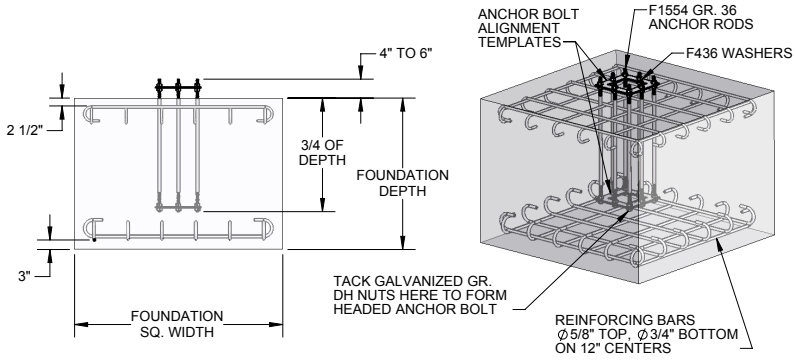


Diagram 2A. *Cast-in Poured Foundation Detail.*

Note: Foundation requirements are based on a soil pressure of 2500 lbs per square foot. Concrete recommended for foundation is 3000 lbs. per square inch of compressive force.

Note: Foundation/concrete must cure 7 days prior to column installation. Foundation/concrete must cure 28 days prior to using fall arrest system.

STEP 2A - COLUMN INSTALLATION (POURED FOUNDATION) (CONTINUED)

2.3 Remove top template and clean threads. Lubricate threads with beeswax (toilet wax ring may also be used). Set leveling nuts at a height of 1/2 of the anchor bolt diameter from the foundation and make level. Lubricate washers and place on top of leveling nuts (***diagram 2B***).

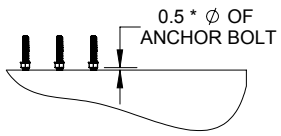


Diagram 2B. *Installing leveling nuts.*

WARNING

Leveling nut height from concrete shall not exceed one anchor bolt diameter.

2.4 Properly orient column so that knee brace bracket will face monorail. 4', 5' and some 6' cantilevers do not require knee braces. For these, orient column top plate so that the longer side is parallel with the header direction (***diagram 2C***).

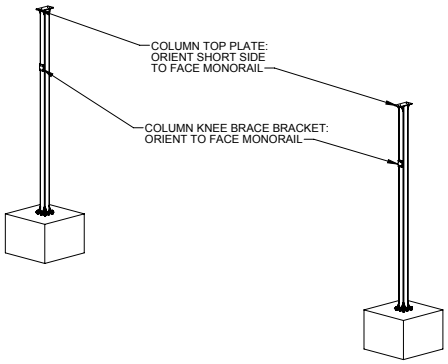


Diagram 2C. *Column orientation.*

2.5 Using proper rigging practices (by others), raise column as vertical as possible, place over anchor rods and lower into place. Lubricate and install flat washers and secure with top nuts. Snug tighten leveling and top nuts in a star pattern (***diagram 2D***).

2.6 After monorail is installed, columns may be slightly tilted away from overhung hung load to level the monorail if needed. Final anchor rod nut tightening will be done at the end of the install. For F1554 grade 36 anchor bolts with clean, lubricated threads and bearing surfaces, snug tight and verification torques are shown (***chart 2A***).

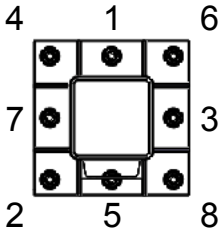


Diagram 2D. *Anchor nut tightening pattern.*

2.7 Install remaining columns (repeat **steps 2.3** through **2.6**).

2.8 Turn of the nut method is used for final tightening of anchor rod nuts. Mark one flat on top nut and mark a corresponding reference on the base plate for each bolt. Top nuts should be turned in increments in a star pattern (at least two full tightening cycles) to achieve 1/6 turn of nut (one flat).

2.9 Verify nut tightening using torque wrench. Leveling nut and top nut verification torque is shown in ***chart 2A***.

2.10 After at least 48 hours, recheck torque on nuts.

Gr. 36 Anchor Bolt Dia.	Snug Tight Torque	Verification Torque
3/4"	25 ft.-lbs.	75 ft.-lbs.
7/8"	40 ft.-lbs.	120 ft-lbs.
1"	60 ft.-lbs.	180 ft.-lbs.

Chart 2A. *Torque chart.*

STEP 2B - COLUMN INSTALLATION (SHALLOW FOUNDATION)

NOTE: Shallow foundation installations are for indoor applications on existing reinforced slabs that meet the minimum required thickness throughout the required area. Refer to the General Arrangement Drawing for these requirements. Also, the area shall be free of cracks, seams, expansion joints and walls. Foundation requirements are based on a concrete compressive strength of 3000# per square inch. For applications where the existing floor does not meet the requirements for the desired system, consider a Free Standing (goal post) Monorail.

2.11 Post-Installed Anchor Bolts requirements:

A) Anchor bolts (by others) shall have an ICC-ES listing demonstrating suitability for the application.

B) Anchor bolts (by others) shall be installed in accordance with the manufacturer's instructions and requirements.

Note: Chemical (epoxy) anchor bolts are recommended.

Note: Base plate hole size may exceed anchor bolt manufacturer's recommendations. If base plate hole diameter is greater than bolt diameter plus 1/4", refer to AISC Design Guide 1 for minimum washer size and thickness recommendations.

2.12 Refer to General Arrangement Drawing for base plate hole size and location. Layout and drill holes in slab according to anchor bolt manufacturer's recommendations for drill bit size, depth and special inspection requirements. Vacuum up cement dust. ***Diagram 2E*** shows a typical post-installed shallow foundation.

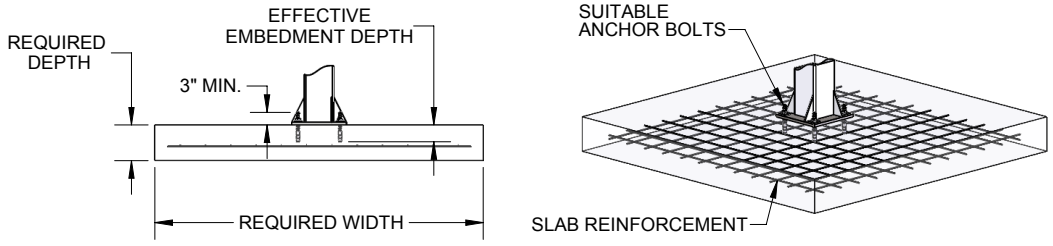


Diagram 2E. *Post-installed shallow foundation detail.*

2.13 Install anchor bolts (not included) according to manufacturer's installation directions and requirements.

2.14 Refer to **step 2.4**, page 6, for proper column orientation. Position column squarely over anchor bolts and lower into place. Secure with anchor bolt hardware (not included) according to manufacturer's installation directions and requirements.

2.15 Check to see if column is plumb. If column is not plumb, loosen anchor bolt nuts and place steel shims (not included) under base of column until plumb. After column is plumb, tighten all nuts according to manufacturer's instructions.

2.16 Install remaining columns (repeat **steps 2.12** through **2.15**).

STEP 3 - KNEE BRACE INSTALLATION

NOTE: Knee braces are not required for 5 foot or less cantilevers. Some 6 foot cantilevered supports may also not require a knee brace.

3.1 Raise and position knee brace to mount to bracket on column.

3.2 Install hardware as shown in ***diagram 3A***. Galvanized flat washers are provided for outdoor applications to protect the finish on the mounting plate. Hold the nut stationary and turn the bolt head against the flat washer.

3.3 Tighten hardware after installing header.

3.4 Repeat **steps 3.1** and **3.2** for remaining knee braces.

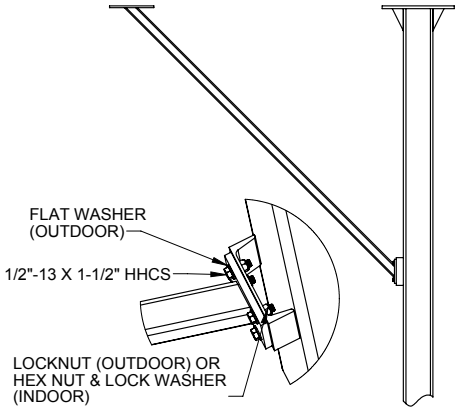


Diagram 3A. *Installing knee brace.*

STEP 4 - HEADER (CANTILEVER) INSTALLATION

IMPORTANT: Threaded rod for header installation is either the same length or shorter than threaded rod used for monorail installation; do not confuse them.

4.1 Orient the header as shown in ***diagram 4A***. The header has two different size end plates. One is flush with the header channel to provide more positioning adjustment at the column connection. One is oversized to act as a stop plate if the monorail hardware should loosen. Orient so that the oversized end plate is away from the column. The header weldment also has an additional spacer plate (spacer plates are welded to the top and bottom of the header channel). This extra spacer plate is only welded to the bottom of the header and is used as a stop plate for the knee brace connection. Orient the header so that this extra plate is on the bottom.

Note: For outdoor systems, all hardware may not be galvanized. You will need to use cold galvanizing spray provided for any unplated/galvanized hardware (refer to **steps 1.5** and **1.6**).

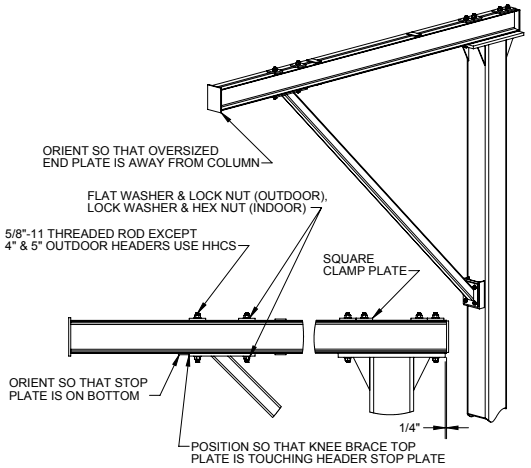


Diagram 4A. *Orienting and installing header.*

4.2 Lift and position header onto secured column and knee brace. Using clamp plates and hardware provided, attach header to column (refer to ***diagram 4A***). Leave hardware loose. Using clamp plates and same hardware provided, attach header to knee brace. Draw up knee brace and reposition header so that edge of knee brace top plate is touching edge of header stop plate. The header channel length is cut to allow the channel to extend 1/4" past the column top plate. This provides extra adjustment, if needed, to position the header stop plate to make contact with the knee brace.

4.3 Tighten header to column hardware and header to knee brace hardware to 95 ft.-lbs. of torque per nut.

4.4 Tighten knee brace to column hardware to 50 ft.-lbs. of torque per nut.

WARNING

There must be a minimum of two threads showing at both ends of the threaded rod and at end of hex head cap screws.

4.5 Install remaining headers (repeat **steps 4.1** through **4.4**).

STEP 5 - TETHER TRACK® INSTALLATION

5.1 Refer to the enclosed General Arrangement Drawing to plan the sequence in which the monorail sections will be installed. Monorail sections that have splice plate style connections (Z and ZD styles) may need to be assembled to the mating monorail section prior to lifting and installing on the headers. Do not lift greater than two assembled (splice plate style connection only) monorail sections at a time. Do not lift assemblies greater than 54 feet long. Do not allow more than 13 feet of track to extend past the header without support. For sleeve and truss plate style connections (S, SL, SLX and SLD styles), only lift these sections individually (not assembled).

WARNING

The locations of the runways cannot deviate from the locations shown on the drawing. Changing the locations will void the design and the warranty.

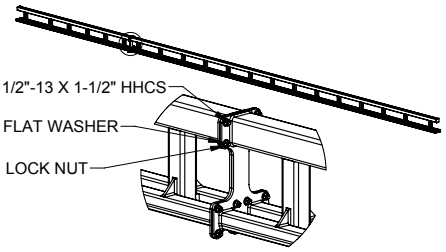


Diagram 5A. *Plate style splice joint detail.*

Splice Joint Plate Style Connections

5.2 Align mating monorail sections and install hardware (***diagram 5A***). Verify track flanges (trolley wheel running surfaces) are aligned before tightening. Run a finger on the inside of the track flange and use a soft blow mallet to align plates until no lip is felt. Also check alignment of mating sections for bow and camber. Steel shims (by others) may be used between the splice plates to adjust any misalignment. Tighten hardware to 50 ft.-lbs. of torque per nut.

Monorail to Header Connections

5.3 The first monorail section(s) to install shall be connected to two headers. Subsequent sections will be splice connected to the previously installed section and a header. ***Diagram 5B*** shows the top tube on top of the header. ***Diagram 5C*** shows the top tube below the header. Refer to the enclosed General Arrangement Drawing to determine the correct orientation. Threading the header through the monorail truss (***diagram 5B***) is the most common. When there is at least a 1-1/2" clearance between the header's oversized end plate and the space between the track and top tube on the truss, the threaded orientation is used. The monorail centerline should be located from the end of the header as shown in ***diagram 5B***, for threaded mounting or as shown in ***diagram 5C***, for under hung mounting.

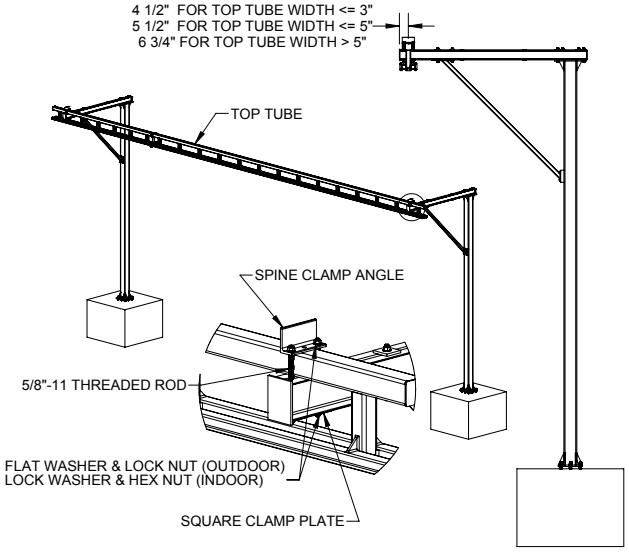


Diagram 5B. *Installing threaded monorail.*

WARNING

The largest monorail assembly required to install may be 54 feet long and weigh 1300 lbs. Do not perform installations under adverse weather conditions or without the proper lifting equipment.

5.4 Using proper rigging practices (by others) lift the monorail section(s) into place and secure to the header using spine clamp angles, clamp plates, and hardware provided (***diagrams 5B*** and ***5C***).

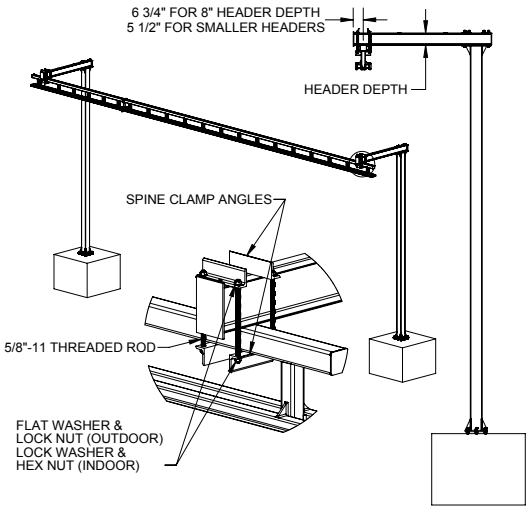


Diagram 5C. *Installing under hung monorail.*

Note: For outdoor systems, all hardware may not be galvanized. You will need to use cold galvanizing spray provided on any unplated/galvanized hardware (refer to **steps 1.5** and **1.6**, page 4).

STEP 5 - TETHER TRACK® INSTALLATION (CONTINUED)

5.5 Verify monorail is level in direction toward column and along its length. For cast-in anchor bolts, column leveling nuts may be used to adjust monorail to make level.

5.6 Tighten hanger hardware to 50 ft.-lbs. of torque per nut.

5.7 If you **DO NOT** have additional monorails to install, go to **step 6**, on page 11. If you have plate style splices, refer to **step 5.2**. If you have sleeve style splices, proceed to **step 5.8**.

IMPORTANT: To install additional monorail sections, monorails must be spliced together.

WARNING

Do not deviate from the dimensions specified in the General Arrangement Drawing for maximum space from header center to splice joint. Typically 48” maximum for splice sleeve style joint and 1/4 of support center distance for splice plate style joint.

Splice Sleeve Style Joint Instructions

5.8 Attach splice hardware to joint sleeve. Slide splice joint sleeve over track portion of installed runway.

5.9 Lift next monorail section into position for splicing to previously installed monorail, bringing monorail ends together. Maximum gap between ends of trolley riding surface flange shall be less than or equal to 1/16” (1.5mm). Center splice joint sleeve over the two track ends (***diagram 5D***). If plate style joint, refer to **step 5.2**.

5.10 Place a top tube splice plate on each side of monorail truss tube and bolt into place (***diagram 5D***). “Hand tighten” bolts.

Note: Do not torque bolts until track has been attached to header and adjusted for smooth transition - **steps 5.11** through **5.13**.

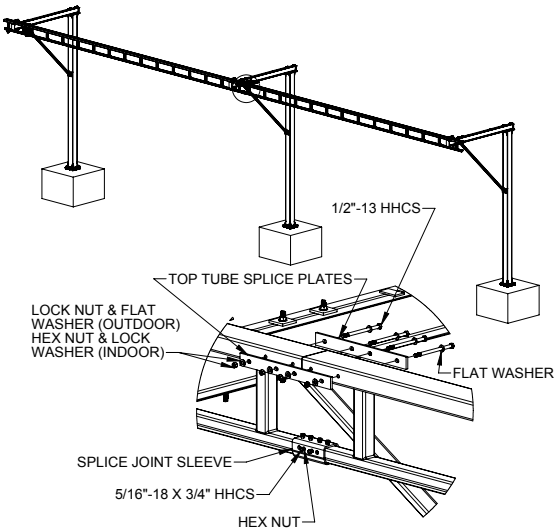


Diagram 5D. *Sleeve style splice joint detail.*

5.11 Track running-surface misalignment at joints shall be adjusted within 1/16” when installed.

5.12 To attach monorail to header, repeat **steps 5.4** through **5.6**, beginning on page 9.

5.13 To adjust track for smooth transition, use bolts along **top of splice joint sleeve** to force track down onto lower flanges of splice. Check to see that transition from one track to the other is smooth: no raised areas to inhibit trolley operation. Use bolts along the **sides of splice joint sleeve** to align track laterally. Check to see that track portion of monorail is horizontally and vertically flush: transition from one track to the other is smooth. Tighten jam nut to lock bolts in place (***diagram 5D***).

5.14 Tighten nuts on top tube splice plates to 40 ft.-lbs. torque per nut.

5.15 Repeat **steps 5.8** through **5.14** for remaining monorails.

End Stop Installation

5.16 Install end stop (***diagram 5E***) (molded bumper with thru bolt), in end of monorail. For dual track, install end stops in both tracks at one end. Tighten nut on thru bolt until lock washer is compressed (indoor) or tighten lock nut (outdoor) until a minimum of two threads extends beyond nut.

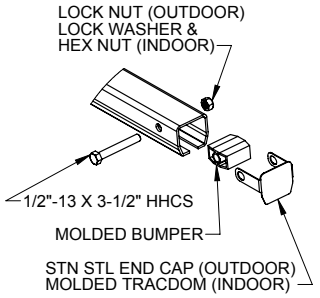


Diagram 5E. *Installing end stops.*

STEP 6 - TROLLEY INSTALLATION

6.1 Clean inside flanges of track with a clean, dry cloth (**do not use any kind of cleaning solution**) to remove grit or debris that may have collected during shipping, storage, or installation.

6.2 Be sure end stop is installed in one end of track.

6.3 If using a self-retracting lifeline, attach self-retracting lifeline to trolley eye nut using ANSI approved hardware supplied with lifeline. Refer to the self-retracting lifeline manual.

6.4 Roll trolley into open end of track. Verify trolley freely rolls.

6.5 For two person, single track systems, repeat **steps 6.3** and **6.4** for second trolley.

6.6 **(Dual Track only)** Repeat **steps 6.1** through **6.4** for second track.

6.7 Install second end stop per **step 5.15** (***diagram 5E***, page 10).

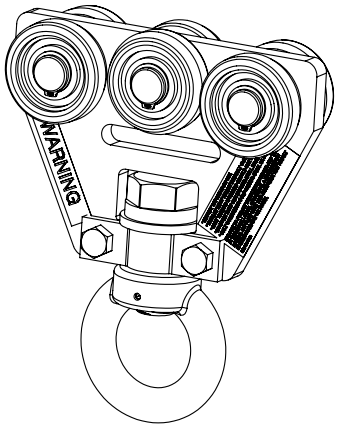


Diagram 6A. *Tether Track® trolley installation.*

STEP 7 - FINAL STEPS

TIP: Do not throw away this manual: the maintenance schedule is on the back cover.

7.1 For cast-in anchor bolts, complete tightening procedure. See **steps 2.8** through **2.10**.

7.2 Check to make sure all bolts are tight. For indoor, check to make sure lock washers are compressed.

7.3 Touch up system with paint provided. If primer was provided, it must be applied prior to spraying top coat. Any areas of rust should be immediately repaired.

7.4 Verify capacity labels are legible from the ground or egress location.

7.5 Proof testing may be performed if required by state or local jurisdictions. The qualified person responsible for this fall arrest system may also request a proof load test. The Free Standing Cantilevered Tether Track® System has been designed to withstand a static proof load test not to exceed 110% of the rated MAF with no visible permanent deformation. The trolley shall be slowly loaded to avoid additional dynamic loads. The proof load should be applied for a minimum of one minute. After this test is complete, Free Standing Cantilevered Tether Track® System shall be inspected as if a fall event had occurred.

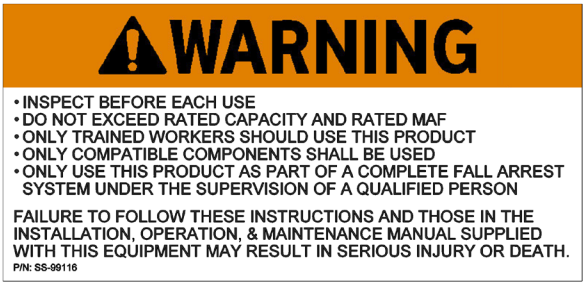
7.6 Keep Packing List, Installation Manual, General Arrangement Drawing, and any other inserts filed together in a safe place.

LABELS

Monorail Labels

One Worker, Single Monorail Label.

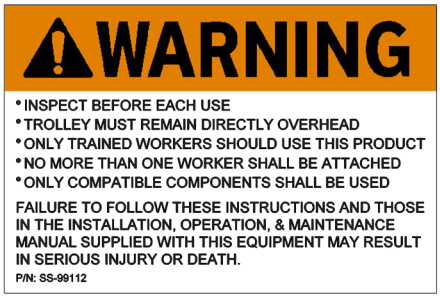
Two Workers, Single Monorail Label.



Monorail Warning Label.

Trolley Labels

Trolley Label.



Trolley Warning Label.

AUTHORIZED PERSON INSTRUCTIONS

Performing duties where a fall hazard exists can be dangerous. Therefore, it is important for the Authorized Person to be instructed in the use of their Complete Fall Arrest System and to understand the severe consequences of careless use. It is not intended that these suggestions take precedence over existing plant safety rules and regulations or OSHA regulations. However, a thorough study of the following information should provide a better understanding of safe use and afford a greater margin of safety. It must be recognized that these are suggestions for the authorized person working in the presence of a fall hazard. It is the responsibility of the owner to make personnel aware of all federal, state and local rules and codes, and to make certain authorized persons are properly trained.

Qualifications

Working while being exposed to a fall hazard, to be safe and efficient, requires skill: the exercise of extreme care and good judgment, alertness and concentration, and rigid adherence to proven safety rules and practices as outlined in applicable and current ANSI and OSHA safety standards. In general practice, no person should be authorized to work while being exposed to a fall hazard:

- Who cannot speak the appropriate language or read and understand the printed instructions.
- Who is not of legal age to work while being exposed to a fall hazard.
- Whose hearing or eyesight is impaired (unless suitably corrected with good depth perception).
- Who may be suffering from heart or other ailments which might interfere with their safe performance.
- Who may be pregnant or have any condition where the exposure to maximum arresting force of a fall event may be a health risk.
- Unless the person has carefully read and studied this operation manual.
- Unless the person has been properly instructed.
- Unless there is a rescue plan in place and at least one additional authorized person that has been instructed in the implementation of the rescue plan.
- Unless the person has demonstrated his or her instructions through practical use of the Complete Fall Arrest System.
- Unless the person is familiar with fall protection equipment and the safe use of this equipment.

Handling the Trolley Motion

Before using the trolley of the Tether Track® Anchorage System, the Authorized Person should be sure that the trolley is clear of any obstructions that would prevent it from freely traveling and that the fall zone, beneath where the work will be performed, is clear of any obstructions that would decrease the required fall clearance height. During use, the trolley should be brought into position so that it is directly over the Authorized Person. The trolley should follow the user's movement and remain overhead. Failure to keep the trolley overhead may cause a pendulum motion during a fall event that will increase fall distance and may expose the user to a side impact with any obstructions. A maximum off vertical angle of 30 degrees is allowed for monorail systems where the pendulum motion would be restricted by a leading edge. In this application, the leading edge may not be sharp enough to cause damage to the lanyard or self retracting lifeline web or cable or SRL specifically designed for a leading edge shall be used.

Outdoor Use

Refer to the General Arrangement Drawing to verify the system has been designed for outdoor use. Outdoor systems are designed for use with ice loads and wind gusts up to 45 mph. However, it is recommended that the user should not expose themselves to a fall hazard if wind gusts exceed 28 mph or if weather and walking surface conditions increase the risk of a fall event occurring. Outdoor systems have been designed to withstand gulf coast winds when not in use. After an extreme weather event, a maintenance inspection is recommended.

GENERAL OPERATIONAL SUGGESTIONS

Know Your Environment and Your Complete Fall Arrest System
Authorized persons should be familiar with the principal parts of the Fall Arrest System and have a thorough knowledge of the safe use, inspection, and limitations of this equipment. The authorized person should be required to know the procedure to rescue a person after a fall event and be trained to rapidly implement this procedure. The authorized person(s) should be aware of any condition that may change while they are exposed to a fall hazard that may jeopardize the integrity of the fall arrest system and the rescue plan. For example, obstructions moving into a fall clearance zone.

Responsibility
Each authorized person(s) should be held directly responsible for the safe use of the Fall Arrest System. Whenever there is any doubt as to SAFETY, the authorized person should remove themselves from exposure to the fall hazard and refuse to re-expose themselves until safety has been assured. It is the responsibility of the employer to train the authorized person(s) in the safe use of the Fall Arrest System and to have managed Fall Protection Plan in place.
Do not permit **ANYONE** to use this equipment unless they are authorized, there is at least one other authorized person within visual range, and there is a rescue plan in place.

Inspection
Test the Tether Track® Anchorage System movement and any attachments and connections before each use. Whenever the authorized person(s) finds anything wrong or apparently wrong, the problem should be reported immediately to the proper supervisor and appropriate corrective action taken.

Suggestions for the use of the Tether Track® Anchorage System
The authorized person should know and follow these suggestions for safe use of this protection equipment.

1. The trolley should move smoothly and gradually as the user moves. If a self retracting lifeline is being used and the retraction tension is not great enough to move the trolley, the user should abruptly jerk the lifeline to lock it and while maintaining tension in the lifeline, the user should pull on the lifeline until the trolley is overhead. Slack should then be removed by allowing the lifeline to retract. Slack should be kept to a minimum at all times.
2. The trolley should be located above the user and as close to the user as possible to minimize freefall distance. The user should verify that the trolley moves as close as possible to the user whenever he or she moves. In the event of a fall, this will help to prevent swinging. The user must not work outside of the designed fall zone.
3. Monorail systems are designed to allow for a 30 degree off-vertical side pull. This maximum angle is selected to minimize the horizontal acceleration experienced during a swing fall. Offset falls, if not restricted by a vertical face, will increase the freefall distance. This extra distance must be accounted for in the fall clearance calculations.
4. Be sure everyone in the immediate area is aware of your use of fall protection equipment and that the fall zone remains clear. Confirm that there is at least one person visually aware of your activities and that there is an authorized fall rescue person on-site.
5. Do not exceed the rated load capacity, number of workers, or maximum arresting force of the Tether Track® Anchor System. Labels with this information are located on every track section for monorails.
6. Make certain that before exposing yourself to a fall hazard, components are properly connected, connectors are properly oriented and latches are fully closed and locked.
7. Check to be sure that all trip hazards are removed and that the fall protection zone is clear of dangerous obstructions when moving to a new location on the Tether Track® Anchor System. Be aware of the boundaries of the fall protection zone. This is detailed on your General Arrangement Drawing supplied with the manual at the time of shipment.
8. At no time should the authorized person be working alone while exposed to a fall hazard. In the event of a fall, a worker left suspended will lose the ability to circulate blood by the contractions of muscles in their legs. This combined with being suspended vertically will eventually result in lack of blood flow to the brain and can lead to death.
9. Do not use equipment with unused Y-lanyard webs, straps or taglines hanging loose. These should be properly stored to prevent tripping hazards and the possibility of snagging during a fall event that may cause an excessive arresting force.
10. This equipment should not be used for any purpose other than fall protection unless it has been specifically designed for multiple purposes.
11. When multiple trolleys are provided on the same track(s), adequate spacing should be maintained between the trolleys to prevent any impact with each other during a fall event.
12. Whenever the authorized person leaves the Tether Track® Anchorage System the following procedure should be followed:
    - Verify that you are removed from the fall hazard or that you have another method of fall protection.
    - Remove your lifeline from the body harness D-ring or remove the lanyard from the trolley eye nut.
    - If using a self retracting lifeline, securely attach a tagline to the lifeline and allow it to slowly retract.
    - Remove lanyard and harness and clean any grease or dirt per manufacturer's instructions. Allow to drip dry and store in a cool, clean, dry environment out of direct sunlight.
    - Make a visual check before leaving anchor system.
    - Notify appropriate person that you are no longer using the fall arrest system.
13. After a fall event or if a safety concern is uncovered during inspection, an "out-of-service" warning sign or signal should be displayed at the access and egress point to this equipment until the system can be inspected and repaired or replaced and inspected.
14. ANY SAFETY FEATURES AND MECHANISMS BUILT-IN OR OTHERWISE PROVIDED WITH THE TETHER TRACK® ANCHOR SYSTEM BY GORBEL ARE REQUIRED FOR THE SAFE USE OF THIS EQUIPMENT. DO NOT, UNDER ANY CIRCUMSTANCES, REMOVE OR OTHERWISE IMPAIR OR DISABLE THE PROPER FUNCTIONING OF ANY SAFETY MECHANISMS OR FEATURES BUILT-IN OR OTHERWISE PROVIDED BY GORBEL FOR SAFE OPERATION OF THIS EQUIPMENT. ANY REMOVAL, IMPAIRMENT OR DISABLING OF ANY SUCH SAFETY MECHANISMS OR FEATURES OR OTHER OPERATION OF THE TETHER TRACK® ANCHOR SYSTEM WITHOUT THE COMPLETE AND PROPER FUNCTIONING OF ANY SUCH SAFETY MECHANISMS OR FEATURES AUTOMATICALLY AND IMMEDIATELY VOIDS ANY AND ALL EXPRESS AND IMPLIED WARRANTIES OF ANY KIND OR NATURE.

LIMITED WARRANTY

It is agreed that the equipment purchased hereunder is subject to the following LIMITED warranty and no other. Gorbel Incorporated ("Gorbel") warrants the manual push-pull Work Station Cranes, Jib Crane, and Gantry Crane products to be free from defects in material or workmanship for a period of ten years or 20,000 hours use from date of shipment. Gorbel warrants the Motorized Work Station Cranes and Jib Crane products to be free from defects in material or workmanship for a period of two years or 4,000 hours use from the date of shipment. Gorbel warrants the G-Force® and Easy Arm™ products to be free from defects in material or workmanship for a period of one year or 2,000 hours use from the date of shipment. This warranty does not cover Gantry Crane wheels. This warranty shall not cover failure or defective operation caused by operation in excess of recommended capacities, misuses, negligence or accident, and alteration or repair not authorized by Gorbel. No system shall be field modified after manufacture without the written authorization of Gorbel, Inc. Any field modification made to the system without the written authorization of Gorbel, Inc. shall void Gorbel's warranty obligation. OTHER THAN AS SET FORTH HEREIN, NO OTHER EXPRESS WARRANTIES, AND NO IMPLIED WARRANTIES, ORAL OR WRITTEN, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, ARE MADE BY GORBEL WITH RESPECT TO ITS PRODUCTS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED. GORBEL SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL, SPECIAL AND/OR CONSEQUENTIAL DAMAGES WHATSOEVER, WHETHER OR NOT FORESEEABLE, INCLUDING BUT NOT LIMITED TO DAMAGES FOR LOST PROFITS AND ALL SUCH INCIDENTAL, SPECIAL AND/OR CONSEQUENTIAL DAMAGES ARE HEREBY ALSO SPECIFICALLY DISCLAIMED. Gorbel's obligation and Purchaser's or end user's sole remedy under this warranty is limited to the replacement or repair of Gorbel's products at the factory, or at the discretion of Gorbel, at a location designated by Gorbel. Purchaser or end user shall be solely responsible for all freight and transportation costs incurred in connection with any warranty work provided by Gorbel hereunder. Gorbel will not be liable for any loss, injury or damage to persons or property, nor for damages of any kind resulting from failure or defective operation of any materials or equipment furnished hereunder. Components and accessories not manufactured by Gorbel are not included in this warranty. Purchaser's or end user's remedy for components and accessories not manufactured by Gorbel is limited to and determined by the terms and conditions of the warranty provided by the respective manufacturers of such components and accessories.

A) DISCLAIMER OF IMPLIED WARRANTY OF MERCHANTABILITY

Gorbel and Purchaser agree that any claim made by Purchaser which is inconsistent with Gorbel's obligations and the warranty remedies provided with Gorbel's products, and in particular, special, incidental and consequential damages, are expressly excluded.

B) DISCLAIMER OF IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE

Gorbel and Purchaser agree that the implied warranty of fitness for particular purpose is excluded from this transaction and shall not apply to the goods involved in this transaction.

C) DISCLAIMER OF EXPRESS WARRANTY

Gorbel's agents, or dealer's agents, or distributor's agents may have made oral statements about the machinery and equipment described in this transaction. Such statements do not constitute warranties, and Purchaser agrees not to rely on such statements. Purchaser also agrees that such statements are not part of this transaction.

D) DISCLAIMER OF SPECIAL, INCIDENTAL AND CONSEQUENTIAL DAMAGES

Gorbel and Purchaser agree that any claim made by Purchaser which is inconsistent with Gorbel's obligations and the warranty remedies provided with Gorbel's products, and in particular, special, incidental and consequential damages, are expressly excluded.

E) DEALER OR DISTRIBUTOR NOT AN AGENT

Gorbel and Purchaser agree that Purchaser has been put on notice that dealer or distributor is not Gorbel's agent in any respect for any reason. Gorbel and Purchaser also agree that Purchaser has been put on notice that dealer or distributor is not authorized to incur any obligations or to make any representations or warranties on Gorbel's behalf other than those specifically set forth in Gorbel's warranty provided in connection with its product.

F) MERGER

This warranty agreement constitutes a final and complete written expression of all the terms and conditions of this warranty and is a complete and exclusive statement of those terms.

G) PAINTING

Every crane (excluding components) receives a quality paint job before leaving the factory. Unfortunately, no paint will protect against the abuses received during the transportation process via common carrier. We have included at least one (1) twelve ounce spray can for touchup with each crane ordered (unless special paint was specified). If additional paint is required, contact a Gorbel® Customer Service Representative at 1-800-821-0086 or 1-585-924-6262.

Title and Ownership:

Title to the machinery and equipment described in the foregoing proposal shall remain with Gorbel and shall not pass to the Purchaser until the full amount herein agreed to be paid has been fully paid in cash.

Claims and Damages:

Unless expressly stated in writing, goods and equipment shall be at Purchaser's risk on and after Seller's delivery in good shipping order to the Carrier. Gorbel shall in no event be held responsible for materials furnished or work performed by any person other than it or its authorized representative or agent.

Cancellations:

If it becomes necessary for the purchaser to cancel this order wholly or in part, he shall at once so advise Gorbel in writing. Upon receipt of such written notice all work will stop immediately. If the order entails only stock items, a flat restocking charge of 15% of the purchase price will become due and payable by Purchaser to Gorbel. Items purchased specifically for the canceled order shall be charged for in accordance with the cancellation charges of our supplier plus 15% for handling in our factory. The cost of material and/or labor expended in general fabrication for the order shall be charged for on the basis of total costs to Gorbel up to the time of cancellation plus 15%.

Returns:

No equipment, materials or parts may be returned to Gorbel without express permission in writing to do so.

Extra Charge Delay: If Purchaser delays or interrupts progress of Seller's performance, or causes changes to be made, Purchaser agrees to reimburse Gorbel for expense, if any, incident to such delay.

Changes and Alterations:

Gorbel reserves the right to make changes in the details of construction of the equipment, as in its judgment, will be in the interest of the Purchaser; will make any changes in or additions to the equipment which may be agreed upon in writing by the Purchaser; and Gorbel is not obligated to make such changes in products previously sold any customer.

Third Party Action:

Should Gorbel have to resort to third party action to collect any amount due after thirty (30) days from date of invoice, the Purchaser agrees to pay collection costs, reasonable attorney's fees, court costs and legal interest.

OSHA Responsibilities:

Gorbel agrees to fully cooperate with Purchaser in the design, manufacture or procurement of safety features or devices that comply with OSHA regulations. In the event additional equipment or labor shall be furnished by Gorbel, it will be at prices and standard rates then in effect, or as may be mutually agreed upon at the time of the additional installation.

Equal Employment Opportunity:

Gorbel agrees to take affirmative action to ensure equal employment opportunity for all job applicants and employees without regard to race, color, age, religion, sex, national origin, handicap, veteran, or marital status. Gorbel agrees to maintain non-segregated work facilities and comply with rules and regulations of the Secretary of Labor or as otherwise provided by law or Executive Order.

INSPECTION AND MAINTENANCE SCHEDULE

GORBEL® TETHER TRACK® FREE STANDING CANTILEVERED MONORAIL ANCHOR SYSTEMS: INSPECTION BEFORE EACH USE

OSHA and ANSI require an inspection of the entire fall protection system before each use. The Tether Track® Anchor System is a vital component of the complete fall protection system. Checking for the proper functioning of this system is essential. These pre-use checks are intended to be tactile and visual.

If the required maintenance procedures have been properly followed, connections between the track and supporting structure will remain secure. Any extreme conditions that you are aware of that may have occurred since the last maintenance procedure should be reported to the proper supervisor and an evaluation made to determine if the maintenance schedule requires modification. Some examples of extreme conditions are: a fall arrest event, excessive vibration in the system or structure, swaying of the support structure, an impact to the system or support structure, or an unauthorized person working on the system.

The previous sections, Authorized Person Instructions and General Operational Suggestions, provide important pre-use and in-use instructions and inspection guidance. The following provides a suggested checklist divided into the six main components of the Tether Track® Anchor System. Components not listed require pre-use inspection as detailed by their manufacturers.

	YES	NO!
AUTHORIZED PERSON		
Are you authorized by your employer to perform work at height?		
Are you aware of a written procedure for the use of this equipment and does it include a rescue plan?		
Have you been trained in the use of this equipment?		
SURROUNDING ENVIRONMENT		
Is this system being used as approved by a qualified person?		
Is there adequate clearance to arrest a fall?		
Will you remain in the fall zone area allowed by this system?		
Are dangerous obstructions removed from the fall zone?		
Are nearby people aware of your pending work at height?		
Is there an authorized person within sight that has been trained in the rescue procedure?		
SUPPORTING STRUCTURE		
Is the integrity of the foundation adequate?		
Are column weldments and header weldments free of deformed, bent or damaged members?		
Are all anchor bolts installed and is the column weldment base contacting the foundation?		
CONNECTIONS TO TETHER TRACK®		
Has scheduled maintenance been appropriately performed?		
TETHER TRACK®		
Is track rigid and horizontal?		
Is track free of deformed, bent or damaged sections?		
Are endstops in place?		
Is the Tether Track® Anchor System rated for the capacity and number of people using it?		
TROLLEY		
Is there only one lanyard or SRL attached to the trolley?		
Is lanyard or SRL compatibly attached to trolley eyenut?		
Does trolley freely roll and remain overhead?		

If the answer to any of these questions on the checklist is no, remove yourself from the fall hazard and report the issue to the proper supervisor.

INSPECTION AND MAINTENANCE SCHEDULE (CONT.)

GORBEL® TETHER TRACK® FREE STANDING CANTILEVERED MONORAIL ANCHOR SYSTEMS: INSPECTION AFTER A FALL ARREST EVENT

Free Standing Cantilevered Supporting Structure

- Inspect foundation for any signs of damage or cracking. Repair as required.
- Inspect column weldment connections to foundations. Check torque requirements per anchor bolt manufacturer's instructions for post-installed (typically applying 20% of installed torque value is sufficient to determine if anchor bolt is loose). Check torque requirements per ***chart 2A***, page 6, for cast-in anchor bolts.
- Inspect column weldment and header weldment for any visual cracking in welds and/or any permanent deformation. Repair as required.
- Verify header clamp plate hardware is tightened to 95 ft.-lbs. of torque per nut.
- Verify knee brace to column hardware is tightened to 50 ft.-lbs. of torque per nut.

Monorail

- Support each Tether Track® section by other means and loosen all support hardware (sleeve and top tube splice joint, plate style splice joint and spine clamp angle). This will relieve any stress and misalignment in the anchor system members that may be retained by the hardware from the arresting force. Any misalignment caused by hardware/member shift must be removed before the track sections can be measured for permanent deformation. Ensure all fitments and track sections are aligned. Re-tighten hardware on all components per installation instructions in this manual.

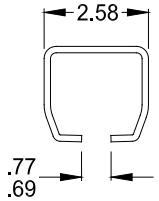


Diagram A. *Track opening specification.*

- At the location in the track where the fall arrest incident took place, measure the track opening and compare to the dimension and tolerance shown in ***diagram A***. Replace section of track if measurement is not within the tolerance.
- Verify the Tether Track® members have not undergone any other permanent deformation. This can be achieved by measuring the camber and bow (***diagram B***) of the enclosed track member and top tube member (if trussed track).
- Using a string (kite), two clamps, and a measuring device (ruler, tape measure, etc.), measure from support to support (covering track area where arrest took place).

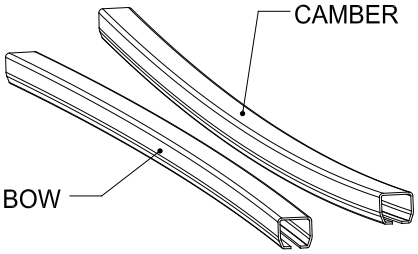


Diagram B. *Camber and bow.*

- Clamp one end of string to the concave face of track, at the support. Travel to the other support pulling the string taut, not allowing it to sag, and clamp it in the same location on track at the support.
- Measure the distance from the string to the track face where this distance is greatest (usually at mid-span).
- If this measurement is greater than .125" X length of track in feet between supports / 10' then replacement of track section is required.
- Repeat this for both bow and camber of both the enclosed track member and top tube member (if trussed).
- If arrest took place on cantilevered portion of track, measurement will be from end of track to first support.
- Visually inspect end stops for fractures or deformation, replace if any are found.

Trolley

- Roll trolley in track listening for abnormal thumping noise. If heard, this indicates there may be debris sticking to wheel(s) or a flat spot on wheel(s) and wheel replacement is required.
- Remove endstop and carefully remove trolley from track section, install end stop bolt back into hole for safety purposes.
- Inspect trolley wheels for debris. clean off if any debris is found with clean dry cloth.
- Inspect black polyurethane washer between bolt head and metal washer for deformity. If bolt head is wedged into washer, press up on eyebolt while pulling down with hands until black washer and bolt head have separated. Verify eyebolt freely swivels.
- Further, visually inspect trolley wheels for flat spots and/or fractures. If any are found, specific wheel replacement is necessary.
- Place trolley back into track and secure with endstop and hardware.

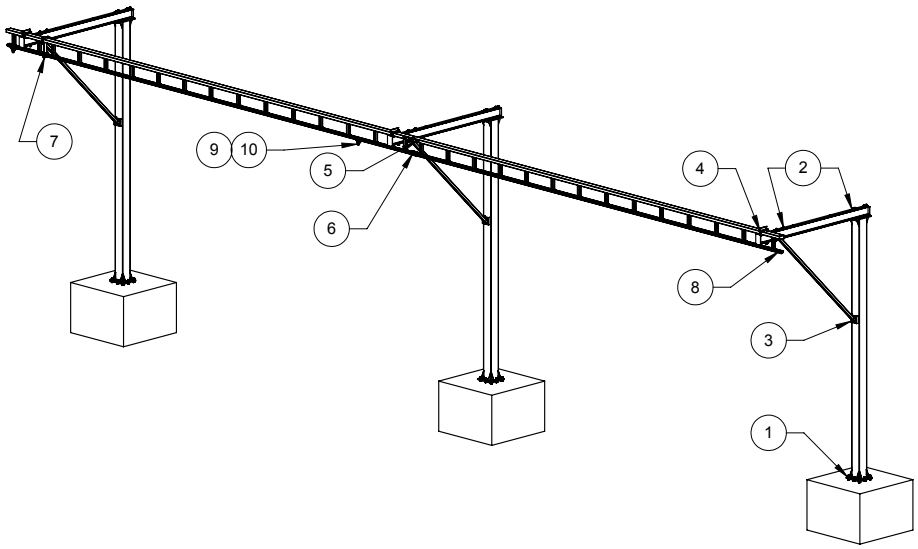
WARNING

All other components are to be inspected per their manufacturer's instructions.

INSPECTION AND MAINTENANCE SCHEDULE

GORBEL® TETHER TRACK® FREE STANDING CANTILEVERED MONORAIL ANCHOR SYSTEM INSPECTION AND MAINTENANCE SCHEDULE			
ITEM	**COMPONENT**	**MAINTENANCE**	**FREQUENCY***
1A	**Post-Installed Anchor Bolts**	Check that nuts are tightened to manufacturer's specifications. Check foundation for cracking.	Every 2000 hours or yearly
1B	**Cast-in Anchor Bolts**	Check that leveling and top nuts are tightened to verification torque (***chart 2A***, page 6). Check foundation for cracking.	Every 2000 hours or yearly
2	**Header Clamp Plate**	Check for nuts tightened to 95 ft.-lbs.	Every 2000 hours or yearly
3	**Knee Brace to Column Hardware**	Check for bolts tightened to 50 ft.-lbs.	Every 2000 hours or yearly
4	**Spine Angle Clamp Hardware**	Check for nuts tightened to 50 ft.-lbs.	Every 2000 hours or yearly
5	**Top Tube Splice Plate**	Check for nuts tightened to 40 ft.-lbs.	Every 2000 hours or yearly
6	**Splice Joint Sleeve**	All bolts should be in contact with track. Check track for alignment and that wheel rolling surface is flush.	Every 2000 hours or yearly
7	**Splice Joint Plate**	Check for nuts tightened to 50 ft.-lbs. Check track for alignment and that wheel rolling surface is flush.	Every 2000 hours or yearly
8	**End Stops**	Check for full compression of lockwasher (indoor). Check for minimum of two exposed threads past lock nut (outdoor).	Every 2000 hours or yearly
9	**Wheels**	Check for cracks, pits and/or grooves: all of these affect trolley tracking. If any of these conditions exist, wheels should be replaced.	Every 2000 hours or yearly
10	**Tether Trolley Connector**	Check eye nut for wear. Check that clamp plate lock nuts are tightened to 12 ft.-lbs. Check that black spring washer is not deformed. Check for smooth rolling action.	Every 2000 hours or yearly
11	**Capacity and Warning Labels**	Check that all labels are in place and legible. Replace labels if damaged or illegible.	Every 2000 hours or yearly
12	**Connecting Equipment**	Inspect all protective equipment connected to the Tether Track® Anchorage System following the operation and maintenance manuals provided for each piece of equipment.	As required by manufacturer
13	**Track and Supports**	Inspect for signs of rust and wear. Replace track if trolley running flange thickness is 10% less than originally measured thickness.	Every 2000 hours or yearly

***Federal, state and local codes may require inspection and maintenance checks more often. Please check the federal, state and local code manuals in your area. Gorbel recommends a certification inspection interval of no more than one year by a qualified person.**



WARNING

Any changes in rolling effort or unusual noises must be immediately identified and corrected. It is not necessary to lubricate the track or bearings. Lubricating may attract airborne particles and may increase the rolling resistance. **Do not use such substances as WD40®, silicone sprays, oil or grease.**

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